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The Phonology and Inflectional Morphology of Cháʔknyá, Tataltepec de Valdés Chatino, a Zapotecan Language

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The Phonology and Inflectional Morphology of Cháʔknyá, Tataltepec de Valdés Chatino, a Zapotecan Language

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Xlyaʔwé jiʔìn no nkuʔ CháʔknyájiʔìnLoo JoʔòJoʔò.

The Phonology and Inflectional Morphology of Cháʔknyá, Tataltepec de Valdés Chatino, a Zapotecan Language

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This dissertation is a description of the phonology and inflectional morphology of an endangered indigenous language of Mexico stemming from a collaborative research project that places an emphasis on natural language and on describing a language on its own terms. The language described is Tataltepec Chatino (ISO 639-3: cta), a Zapotecan language spoken by fewer than 500 people only in the community of Tataltepec de Valdés in Mexico's Oaxaca state. The language has a complex system of tone in which tone sequences are the crucial morphological element rather than the constituent tones of the tone sequences. The tone system has a slightly peculiar inventory, with the level tones Low, High, and Superhigh rather than Low, Mid, and High in addition to a High-Low contour tone. The tonal system is also notable given the unlinked tone in two tone sequences which only surfaces in particular phonological contexts, but is never displaced from the word it is associated with, unlike canonical floating tones. The segmental phonology shows a language that permits a large number of often very complex onset clusters many of which violate the Sonority Sequencing Principle, but maintains tight restrictions

on codas, allowing only a simple coda which can only be filled by one of two consonants in the language.

Tataltepec Chatino also has interesting morphological features in its complex systems of verb aspect and person inflection which are instantiated by a system of prefixes and a system of complex paradigmatic alternations which only partially intersect. The language also has an unusual word I analyze as a "pseudoclassifier" which appears to serve some pragmatic functions of numeral classifiers while failing to do any lexical classification.

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Chapter 1

Introduction

1.1 The aims of this work

This work seeks to describe and analyze some aspects of the phonology and morphology of the Chatino language of Tataltepec de Valdés (ISO 639-3: cta) as spoken in the town of Tataltepec de Valdés near the confluence of the Río Verde and the Río Leche rivers in Mexico's Oaxaca state. Tataltepec Chatino is a member of the Otomanguean linguistic stock once spoken from central Mexico to Central America. This work is the first effort towards producing a descriptive grammar of Tataltepec Chatino language.

Descriptions of languages have many potential audiences with diverse goals: from heritage speakers wanting to reclaim their language, and academic researchers looking for the presence or particulars of some feature of the language, to curious individuals just wanting to know what a language is like. Given the different aims, backgrounds, and languages of possible readers, a linguistic description could be written in several different ways. Since this dissertation is written in English, and therefore not readily accessible to the majority of competent and heritage speakers of Tataltepec Chatino (who typically command Spanish, not English), this dissertation will be written for an audience of curious researchers with a modest understanding of language. While all efforts have been made to make this document as clear as possible, it is not a pedagogical grammar meant

to help anyone learn to speak Tataltepec Chatino (though its contents could certainly inform such an instructive text) nor is it meant to introduce the reader to the field of modern linguistic analysis.

1.1.1 Theoretical framework

This work is intended to offer a description of Tataltepec Chatino arising from the corpus of natural discourse and elicitation and not from *a priori* assumptions about what categories are (or should be) present in the language or how they ought to behave. As far as a theoretical framework, this description follows the philosophy and suggestions of authors espousing basic descriptive linguistics terms (Dixon, 2010; Haspelmath, 2010; Payne, 1997; Shopen, 2007). Given that even seemingly common and mundane labels can shift their meanings over time either by drift or the leaking of a theory-specific sense into general use, all efforts will be made to define the terminology I will use in this dissertation.

While avoiding *a priori* assumptions, my own theoretical biases have no doubt colored and informed my own analysis and my presentation and formalization of Tataltepec Chatino's structure. I (as well as many of the authors cited in the last paragraph) have been inspired and guided by insights from classical approaches to phonology, Generative Phonology (especially regarding writing rules following the model of Chomsky and Halle (1968)), Autosegmental Phonology (Goldsmith, 1990), and laboratory approaches to phonology.

I acknowledge that my discussions of inflection, especially in the intersection of aspect and subject inflection on verbs, strongly suggests an inferential-realizational theory

of morphology akin to the Word-and-Paradigm and Paradigm Functional morphologies (Anderson, 1992; Matthews, 1972; Stump, 2001; Zwicky, 1985). This approach can be characterized by the central notion that "paradigms are not the epiphenomenon that they are often assumed to be in other morphological frameworks, but are central to the definition of a language's inflectional system" (Stump, 2001, xii). I make no claims about this approach being the most appropriate for an analysis of Tataltepec Chatino nor do I wish to suggest that other approaches might not adequately capture the language's complexity; the Word-and-Paradigm approach has simply seemed the most convenient one to explain the facts of Tataltepec Chatino inflection.

At times, I have chosen to use terminology that is common in those corners of the discipline where Zapotecanists hang out. This has been done to facilitate comparison of Tataltepec Chatino's morphological categories to similar categories in the body of Chatino and Zapotec literature which has bloomed in the past half-century or so. This is especially helpful given the reconstructions of the morphology of Proto-Chatino, Proto-Zapotec, and Proto-Zapotecan, which Tataltepec Chatino's morphemes are either reflexes or cognates of.

The Chatino languages and the Zapotec languages have the benefit of having received a modest amount of attention from historical linguists. Though the present work is first and foremost a synchronic description of Tataltepec Chatino as spoken ca. 2010 CE, comments making reference to reconstructions of Proto-Chatino (E. Campbell, 2013a) and Proto-Zapotec (Kaufman, 1993-2007) will be provided to help explain phenomena such as gaps in syllable structure and apparent co-occurrence restrictions.

1.1.2 A roadmap of the dissertation

The structure of this dissertation is as follows. The remainder of this Chapter will give the reader additional background on the language and its community of speakers, provide a brief typological profile of the language, summarize previous research on the languages of the family, and will describe the orthographic conventions used throughout. The following Chapter 2 will introduce the autosegmental framework which will guide the discussion of Tataltepec Chatino's suprasegmental phonology that will inform the discussion. Next, Chapter 3 will describe the segmental phonological inventory of Tataltepec Chatino: its consonants, it vowels, and the processes affecting each. Then Chapter 4 will introduce the properties of syllables and will discuss notions of the language's phonotactics. Chapter 5 will describe the tonal phonology of the language, and Chapter 6 will compare and contrast the present phonological analysis with earlier published analyses. Moving on to the morpholexical section of the dissertation, Chapter 7 will introduce and briefly describe a number of the salient lexical categories in Tataltepec Chatino, two of which will be explored in depth in the following Chapters 8 and 9 which will detail the inflectional morphology of nouns and verbs. Chapter 10 will conclude the dissertation. Two appendices are attached, one listing the abbreviations used in the linguistic examples of this dissertation (A), and another identifying the Tataltepec Chatino texts that examples are taken from, and pointing out where some of these can be found in digital language archives (B).

1.2 The language and its speakers

This section will provide a brief overview of Tataltepec Chatino's position within the Otomanguean languages and within the Chatino family, and will close with a description of the sociolinguistic situation in Tataltepec de Valdés and a discussion of the vitality of Tataltepec Chatino in that community. But first, a few words must be said about the names of languages and topolects which will be used in this dissertation.

1.2.1 A note on the name(s) of the language and the town

The name "Chatino" is the common name of the language in Spanish and English, which is an approximation of the Chatino endonym, which is a reflex of Proto-Chatino *ìtzáʔ tìná in all modern topolects.[1] While the name "Chatino" is in some sense an exonym applied to the cultural group as a whole and to the names of individual languages of the family, I will use "Chatino" rather than specific endonyms to refer to the Chatino people as a whole and to individual topolects. First, I am aware of no pejorative use of the label in its regional context, and is in fact an approximation of the native name. Second, the use of endonyms to identify specific topolects will place a great burden on the reader who

[1] Anthony Woodbury (p.c., 2015) has proposed that the Spanish name reflects the Spanish approximation of the endonym spoken in an unsyncopated Coastal Chatino topolect which features backed allophones of nasalized vowels. This would explain the /ʧ/ reflex of *tz (which would be /t͡s/ in Zenzontepec Chatino), the presence of *ti* which would have been lost or modified through syncopation, and the *o* vowel which would stem from a Spanish interpretation of the backing of /na/ → [nɑ̃] in some topolects. The only modern community that checks all these boxes is Zacatepec Eastern Chatino, which is an unlikely principal source of Spanish-Chatino contact given Zacatepec's peripheral sociopolitical status. I suggest that the aboriginal (or at least ca. 1527-1635) Chatinophone population of Juquila may have spoken the same variety of Eastern Chatino as Zacatepec (which could have conceivably been settled by Juquileños bound for the coast), and this topolect (or a very similar one) was replaced or lost in Juquila before the modern period thanks to internal Chatinophone immigration. Given the paucity of accessible historical records from the region, we will likely never have enough of the appropriate data to know for sure.

would be forced to distinguish between a number of very similarly spelled names ("Chá? knyá", Chă? tinyan", "Chaq-e tnya", "Tzá? jnyá", etc.). I will refer to Chatino topolects as "X Chatino", or "X Eastern Chatino" where X is the Spanish name of the community in question. I will also apply this same naming process to other Mesoamerican languages that I will mention (chiefly Zapotec and Mixtec languages), since it will be by these names that those people less familiar with these cultures and communities (including myself) will most likely know these languages.

Distinguishing separate languages from dialects is a complex business in most situations, and is especially difficult in Oaxaca, where within-family diversity is ignored or minimized to the point that entire families are commonly treated as a single languages in non-specialist contexts,[2] and the "dialect" label is used pejoratively in Spanish (*dialecto*) to deny the languagehood of any indigenous speech. The Mexican National Institute for Indigenous Languages in its official publications recognizes the plurality of Chatino languages, its catalog refers to divisions within Chatino as *agrupaciones* or *variedades lingüísticas* which while denotationally agnostic serves to understate the diversity within the Chatino languages (Instituto Nacional de Lenguas Indígenas, 2008). Since the status of many linguistic codes as languages versus dialects of some larger language has not been settled for some of the speech patterns I will discuss, and the commonly-used "variety" suggests both membership to a larger language as well as deviance from

[2]This occurs both as underspecification when speaking about particular linguistic codes (``She speaks Mixtec", not ``a Mixtec language" or ``a dialect of Coastal Mixtec") and when generalizing over entire language families ("Chatino has many tones" not "the Chatino languages have many tones"). In this work, language families will be treated as singular entities only when describing facts that, to the best of my knowledge, hold for all modern members of the named families (e.g. "Mixtec and Chatino have nasalized vowels" but "Only a few Zapotec topolects have developed nasalized vowels").

a standard,[3] Following Mair's proposal for Sinitic (1991), I will use the term ``topolect'' to neutrally refer to the Chatino, Zapotec, or Mixtec spoken in a particular location without making a claim as to its status as either an independent language or as a dialect or variant of some other language within these families.

1.2.2 Genetic affiliation of Chatino

Chatino is the name given to the indigenous speech found in nearly fifty communities in Oaxaca. Outside of linguistically-trained persons, "Chatino" is used in Spanish and English to refer to each of the topolects of this group. While there is a single unifying Chatino ethnic identity, often significant differences between the topolects of various locations are readily acknowledged, and understood to form different codes. Curiously, the Chatino-ness of a different location's speech is never questioned or denied. Speakers say that other towns "speak a different Chatino", never that they speak an entirely different language (which linguistic science happens to also consider "Chatino").[4]

In the earliest attempts to identify genetic relationships among languages of Oaxaca, Chatino was often presumed to be more closely related to Mixtec, rather than Zapotec

[3] And in my overhearing, *variante* has begun to move down the euphemism treadmill to adopt some of *dialecto*'s pejorative and racist overtones.

[4] Speakers do identify and recognize other non-Chatino indigenous languages and ethnolinguistic identities. Most relevant to Tataltepec Chatino are the two ethnolinguistic Mixtec identities they distinguish: the *nkuʔ ^{0}kwatyaa* (people Mixtec) which are identified as Mixtecs of the lowland coastal region and the *nkuʔ tykaʔyà* (people ?mountain) who are identified as the Mixtecs of the higher mountainous country to the north and west of the Chatinofonía. The speakers I have consulted do not have a Tataltepec Chatino label for Zapotecs, though *taan* the cognate of `Zapotec' in ZEN (and a likely cognate of pZAP *saa, whose reflexes are the autoethnonym for most modern Zapotec languages) refers not to Zapotecs but to the Valley of Oaxaca, and is used today to refer to itinerant merchants or commodity brokers who are prototypically considered to be from around Oaxaca, which is an area where Zapotec languages were and are spoken.

(Gay, 1881), most likely out of similarities in their phonological inventories due to the presence of nasal vowels, labiovelar stops, and many word-initial NC sequences, which are absent or less common in the phonological inventories of Zapotec languages. Others (Belmar, 1902; Boas, 1913; Mechling, 1912) suggested that Chatino has a closer affinity to Zapotec based on lexical and morphological similarities. Chatino has been proven to be a clear member of the Zapotecan language family which contains the Zapotec languages and its many constituent sub-groups, including the Papabuco languages, and the now-extinct Soltec (Smith Stark, 2007).

Zapotecan's membership within the Otomanguean stock has been clear since the earliest speculations of the language stock's existence, as in the Mixteca-Zapoteca grouping of Orozco y Berra (1864). Nevertheless, various researchers have debated the internal structure of Otomanguean, placing Zapotecan either as an independent branch stemming directly from Proto-Otomanguean (Rensch, 1966), or else forming a subgroup with the Mazatecan languages (Kaufman, 1987, 2006).

1.2.3 Internal classification of Chatino

Variation within Chatino has long been acknowledged since Belmar (1902) uses three different topolects (Zenzontepec, Juquila, and Teojomulco) to compare Chatino to Mixtec and Zapotec. Explicit divisions within Chatino were first given by Boas (1913), who identified three "dialects" (Zenzontepec and its periphery, Tataltepec, and the rest of the Chatinophone communities to the east) based on the observations of his Chatinophone consultant Ezéquiel Vásquez (Figure 1.1). This tripartite division is also observed by B. W. Upson and Longacre (1965) in their reconstruction of Proto-Chatino, though they incorrectly

Language	Topolect
First Dialect	Juquila Chatino
	Yaitepec Chatino
	Yolotepec Chatino
	Amialtepec Chatino
	Temaxcaltepec Chatino
	Teotepec Chatino
	Cuixtla Chatino
	Nopala Chatino
	Lachao Chatino
	Ixpantepec Chatino
	Quiahije Chatino
	Ixtapan Chatino
	Zacatepec Chatino
	Panixtlahuaca Chatino
	Tepenixtlahuaca
Second Dialect	Tataltepec Chatino
Third Dialect	Zenzontepec Chatino
	Tlapanalquiahuitl Chatino
	Tlacotepec Chatino

Figure 1.1: "Dialects" of Chatino (Boas, 1913)

included Elotepec Papabuco data as Chatino. E. Campbell (2013a) has recently shown via phonological, morphological, and lexical isoglosses that there are three distinct genetic units within the modern Chatino languages (Zenzontepec, Tataltepec, and Eastern) with two of these (Tataltepec and Eastern) forming the Coastal Chatino subgroup within the family, as laid out in Figure 1.2.

In Sullivant (under review), I show that the now-extinct Teojomulco Chatino transcribed in Belmar (1902) represents a more divergent Chatino language which occupied a branch of the Chatino family, resulting in the internal structure summarized in the tree diagram in Fig. 1.3. Where available, the ISO 639-6 code of each topolect is given in

Subgroup	Language	Topolect
	Zenzontepec	Zenzontepec Chatino
Coastal Chatino	Tataltepec	Tataltepec Chatino
Coastal Chatino	Eastern	Zacatepec Chatino Quiahije Chatino Yaitepec Chatino Juquila Chatino Yolotepec Chatino Lachao Chatino Teotepec Chatino Nopala Chatino Temaxcaltepec Chatino others

Figure 1.2: Internal structure of Chatino (E. Campbell, 2013a)

parentheses per Lewis et al. (2013). Topolects which are known to have existed, but which do not appear to have been recorded are noted with a double dagger (‡) in parenthesis.

Other internal classifications of Chatino, most notably those of Lewis et al. (2013) and Molina Cruz et al. (2001), agree in separating Zenzontepec Chatino and Tataltepec Chatino as separate languages, though the genetic unit identified by Campbell as Eastern Chatino is split up into two or four divisions. The division of Chatino into four "varieties" by Hernández López and Julián Caballero (1992) and Molina Cruz et al. (2001) (Fig. 1.4). Hernández López and Julián Caballero (1992, 85) states that this division not only takes into account what speakers themselves consider the divisions to be, but also

> [R]etoma una diferenciación estructural de la lengua, que es mínima, sino que tiene que ver con las regiones geográficas y las relaciones sociales que se dan entre los chatinos, así como con el grado de pertenencia que los propios chatinos expresan tener con sus lugares de procedencia, como producto de migración interna.

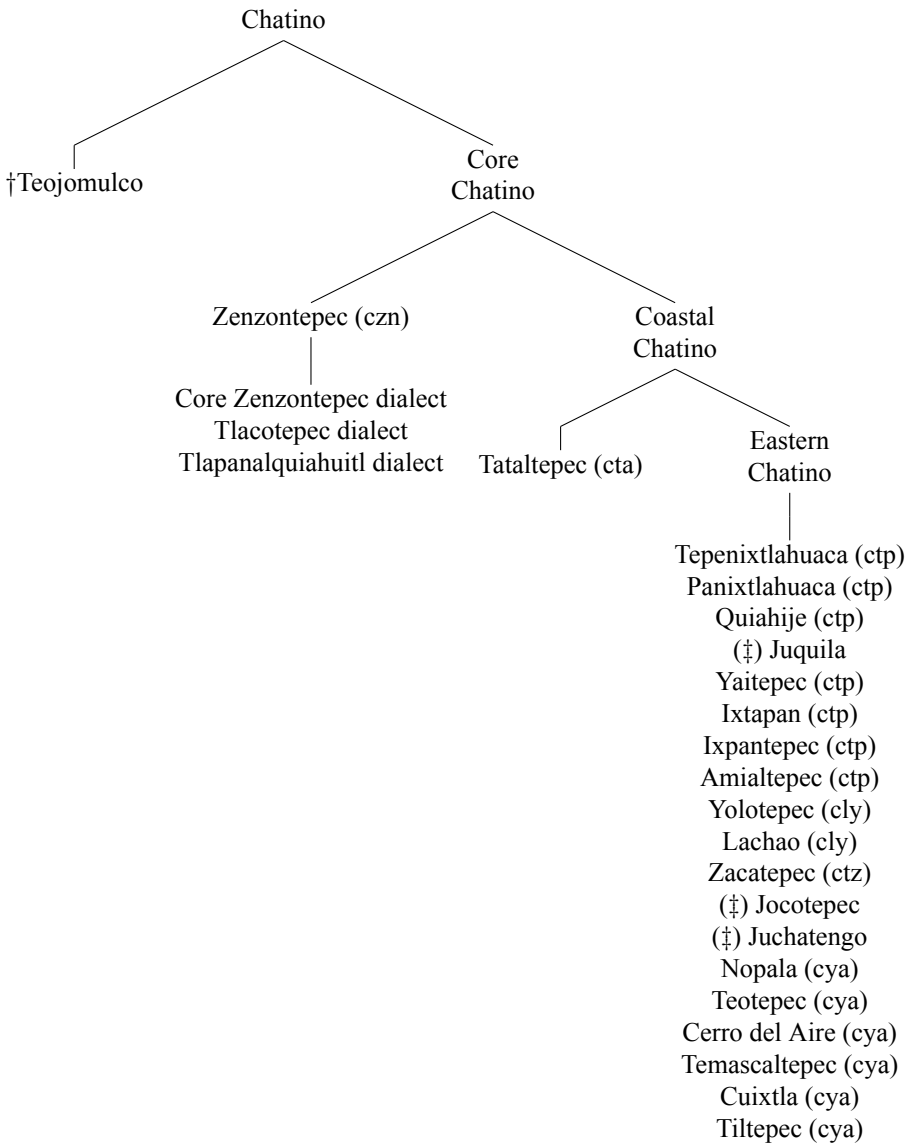

Figure 1.3: Internal structure of Chatino incorporating all attested topolects

[It] returns a structural differentiation in the language, which is minimal, but has to do with the geographic regions and social relations that exist between the Chatinos, just like with the degree of membership that the Chatinos themselves profess to have with their hometowns, as a result of internal migration.

Language	Topolect
Zenzontepec variety	Zenzontepec Chatino
Tataltepec variety	Tataltepec Chatino
Yaitepec variety	Yaitepec Chatino (others)
Nopala variety	Nopala Chatino Lachao Chatino Temaxcaltepec Chatino (others)

Figure 1.4: "Varieties" of Chatino (Molina Cruz et al., 2001)

Given this minimization of linguistic facts, it is unsurprising that this classification serves to reify sociopolitical divisions of the Eastern Chatino area which was most represented by the Chatino speakers who developed the classification. Thus, the two most populous and commericially signficant towns of the region, Juquila and Nopala were considered to be the representative seats of the two Eastern Chatino divisions until Juquila was replaced by nearby Yaitepec over concerns of aboriginally-Chatinophone Juquila having a less Chatino character today.[5]

Lewis et al. (2013) offers a more granular interpretation of the internal structure of Chatino, which also lacks the identification of the Coastal Chatino subgroup. The Chatino language is divided across six ISO codes (Fig. 1.6): one each for Zenzontepec and Tataltepec Chatino, and four for Eastern Chatino. The division of Eastern Chatino into Western Highland, Zacatepec, Eastern Highland and Nopala Chatino is informed by a mutual in-

[5] "Se discutió sobre el nombre de esta variante (Yaitepec o Juquila); acordaron que fuera Yaitepec por ser un municipio netamente chatino" (The name of this variant (either Yaitepec or Juquila) was debated; they agreed it ought to be Yaitepec since it is a purely Chatino municipality.) (Molina Cruz et al., 2001, 14).

Intelligible group	Topolect
Tataltepec	Tataltepec
Panixtlahuaca	Panixtlahuaca
Zacatepec	Zacatepec
Nopala	Quiahije
	Ixtapan
	Temaxcaltepec
	Tiltepec
	Nopala
	Yaitepec
	Lachao
	Yolotepec

Figure 1.5: Chatino groups at least 70% mutually intelligible (Egland, 1978, 10)

telligibility study (Egland, 1978) (Figure 1.5)[6] and the intuitions and impressions of Summer Institute of Linguistics researchers. While divisions within Eastern Chatino may be proven by further research, the divisions of Eastern Chatino in Ethnologue's classification have not been motivated on linguistic grounds.

Though the number of divisions (if any) within Eastern Chatino is undetermined, it is important to note that all classifications identify Zenzontepec Chatino and Tataltepec Chatino as distinct codes, and Tataltepec is always identified as the Chatino language spoken only in Tataltepec de Valdés and by scattered persons in the immediate vicinity of Tataltepec.

[6]The groups listed here were found to be at least 70% mutually intelligible based on speakers' identifications of words recorded in other communities. Of all the communities tested, Tataltepec Chatino was best understood by speakers of Panixtlahuaca Eastern Chatino (32%), Yolotepec Eastern Chatino (21%), and Yaitepec Eastern Chatino (20%). Speakers in some communities such as Temaxcaltepec Eastern Chatino and Quiahije Eastern Chatino were entirely unable to identify decontextualized words of spoken Tataltepec Chatino.

Language	Topolect
Zenzontepec (czn)	Zenzontepec
Tataltepec (cta)	Tataltepec
Zacatepec (ctz)	Zacatepec
Western Highland (ctp)	Quiahije Yaitepec Juquila others
Eastern Highland (cly)	Yolotepec Lachao others
Nopala (cya)	Nopala Teotepec others

Figure 1.6: Chatino languages according to Lewis et al. (2013)

1.2.4 The Chatino people

The Chatinos of Tataltepec have traditionally supported themselves through traditional *milpa* agriculture. In this system of agriculture maize, beans, and other crops were raised in rotating plots of land which were cleared by fire, cultivated for a number of years, then allowed to lie fallow for a time. In addition to these plots, most families tend a small garden with a few fruit trees and keep smaller animals like chickens and turkeys. Less frequently, hogs and goats are also raised.

Traditional attire included a wraparound skirt for women and white cotton breeches for men. Since Tataltepec is in low and hot country, Chatinos often were topless. The traditional attire is today worn daily only by elderly men and women, who supplement the traditional bottoms with white cotton shirts or embroidered blouses in cool weather or when out about town. Older women also supplement their attire with shawls. Many of

these older people frequently can be seen walking barefoot in the streets of Tataltepec. Younger generations dress in the western fashions favored by the local *mestizo* population. In addition to reducing the visible differences between Chatinos and mestizos, this choice of manufactured clothing sold in shops and by traveling merchants over the traditional garments---which are typically made within the community---is also a reflection of the changing economic situation in the community where traditional modes of subsistence through agriculture and homemade goods have given way to a greater reliance on wage labor and purchased goods.

The church-going Chatinos of Tataltepec either attend services at the Catholic church or the more recently arrived Evangelical Christian church. While I cannot add much to the descriptions of traditional Chatino religion and cosmovision given elsewhere (Bartolomé & Barrabas, 1996; Cordero, 1986; Greenberg, 1981), many traditional practices are still present in the highly syncretic form of Catholicism practiced by many in the community. Apart from the white-robed figure of the Virgin of Juquila (who is adored throughout the Chatino region and beyond), perhaps the most visible (and definitely the most smellable) sign of this syncretism in the local church are the piles of basil stems laid at the feet of statues of the Catholic saints. Other practices include a number of herbal remedies for various illnesses and protections against evil spirits, such as the aloe plants (often tied with red ribbons) near many doorways.

The traditional housing was built of sticks with a thatch roof. The thatched roofs have almost entirely given way to corrugated aluminum, and stick walls are nowadays mostly seen on kitchens. Within the town of Tataltepec, the most common Chatino house is built of rammed earth, or fired or unfired adobe bricks. Roofs are most often made of the curved

roofing tiles common throughout Mexico. A family's houses are generally arranged around a shared patio, where a shared hearth with a large clay griddle is often found. More affluent families are now building multi-story poured concrete buildings, which can take on different shapes than the traditional rectangular house without interior corridors.

1.2.5 The Chatinophone region

The Chatino languages are spoken in the Juquila and Sola de Vega districts of Oaxaca state in Mexico. The Chatinophone region extends from the Zenzontepec-Chatino-speaking area around the confluence of the Atoyac and Verde rivers, to the Coastal-Chatino-speaking area occupying the mountaintops and valleys of the Sierra Madre del Sur mountains south of the Atoyac river. Some early records of Chatino being spoken further north are presumed to have mistaken the Papabuco spoken there for Chatino.[7] However, Belmar (1902) presents data from Santo Domingo Teojomulco, quite close to current Papabuco-speaking towns, which as already noted, is a Chatino language, albeit a quite divergent one (Sullivant, under review).

According to ethnohistorical accounts, the Chatinos have occupied their current territory for quite some time, and likely occupied a much larger territory before the modern era, perhaps occupying the littoral areas of Oaxaca as far east as Pochutla (Bartholomew, 1980), and as far west as modern-day Guerrero state (Urcid, 1993; Winter, 1989), though the presence of some non-surviving, non-Chatino languages could explain the phenomena

[7] The indigenous name recorded for Santiago el Menor near Teojomulco, <chesvie> '*capa de anillos*' was identified as Chatino (Martínez Gracida, 1883) when it is more likely a Papabuco name, given the bilabial *vie* 'ring' which would feature a labialized velar stop in any Chatino language (e.g. TAT *kwíʔ* 'ring').

discussed by these authors.[8]

Figure 1.7 shows the location of contemporary Chatinophone communities in the Sierra Madre del Sur mountain range of Mexico's Pacific coast. Names of Chatinophone communities are in yellow (Eastern Chatino-speaking locales), blue (Tataltepec Chatino), or green (Zenzontepec Chatino-speaking towns). In black are the names of Pochutla and Piedra Labrada which may represent the points of furthest westward and eastward expansions of Chatinophone people in prehistoric times. In white, for reference are the regionally important cities of Oaxaca, Acapulco, and Puerto Escondido.

Bartholomew (1980) saw Pochutec's stem-final stress (as opposed to the penultimate stress of the other Aztecan languages) as evidence of influence through contact with some language with stem-final stress. Though a now-lost language could have been responsible for this stress shift, the Chatino languages are the only extant languages in the region with stem-final stress. On the western frontier, Urcid (1993) finds evidence of Valley of Oaxaca influence on inscriptions in Piedra Labrada, suggesting that Zapotecan-speaking scribes wrote the glyphs. Elsewhere, Winter (1989, 66) suggests that "the large occupation of the Lower Río Verde region was probably the center of Chatino groups in Early Urban times".

Since economic and political pressures have forced many Chatinos to leave their communities, speakers of Chatino today live throughout Mexico and the United States of America, though according to 2005 figures, the overwhelming majority of Chatino speakers in

[8]That is, some other language with stem-final stress could have been spoken around Pochutla to cause Pochutec's contact-induced stress shift, and Piedra Labrada could have been inhabited by a group speaking a different Zapotecan language that did not survive into historical times.

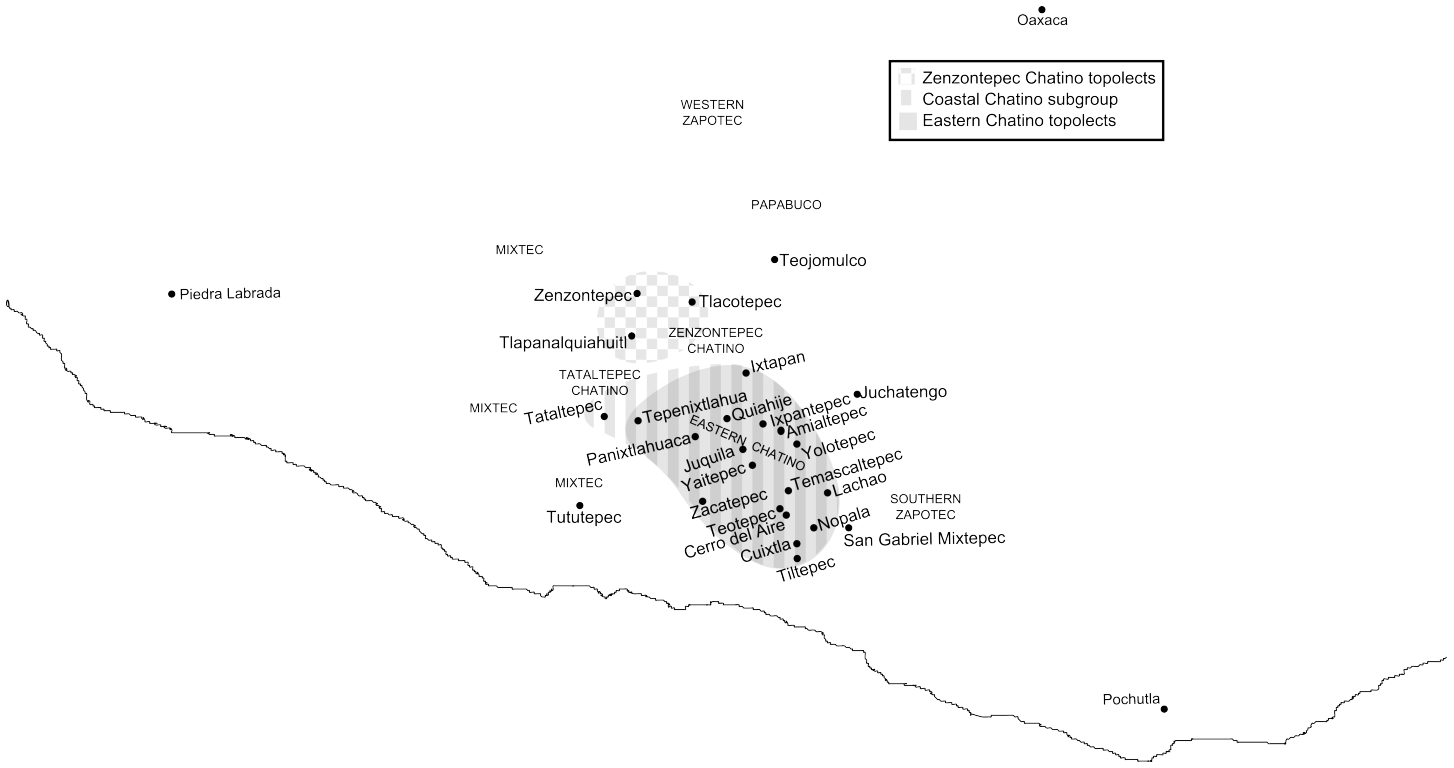

Figure 1.7: The Chatinophone region

Mexico (93%, roughly 39,000 of around 42,000 persons) reside in traditionally Chatino-phone municipalities (Instituto Nacional de Estadística y Geografía, 2009).

The community of Tataltepec de Valdés has likely been known as *Lojoʔò* or the metathesized *Jloʔô* for as long as it was inhabited by Chatino speakers, perhaps as early as the 4th Century BCE founding claimed by the Instituto para el Federalismo y el Desarrollo Municipal and Secretaría de Gobernación (2010). This name means something like 'The holy place'[9] and has cognates in all extant Chatino languages.[10] The rationale for the 'Holy place' toponym comes from Tataltepec's location as a place of repose for travelers on a royal road.[11] The name of Tataltepec is widely believed to derive from a Nahuatl phrase

[9] *<loo* 'face, at' + *joʔò* 'deity, holy' cf. *⁰Lontaʔa* 'Oaxaca' *<loo* 'face, at' + *ntaʔa* 'guaje'.

[10] Santiago Texmelucan Papabuco, spoken some 47 kilometers to the northeast, calls Tataltepec *Lijo'*, which is clearly a loan from Chatino (Papabuco, like most Zapotec languages, has no consonantal /h/ which could occur between vowels in native words) rather than an independent Papabuco name (Speck & Marcial López, 2014).

[11] Instituto para el Federalismo y el Desarrollo Municipal and Secretaría de Gobernación (2010) provides the following history of the community. It is unclear what the source of this information is.

> 1580: El hijo del rey Pedro de Alvarado, Melchor recuperó sus propiedades de la costa del pacífico, …una de tales propiedades era Tataltepec, entonces conocido como "Lugar Sagrado", característico por sus gigantescas montañas abandonadas, donde solo se escuchaban los ruidos de la aves, de las grandes cascadas y del rugido de los animales peligrosos. […] En medio del mencionado lugar pasaba un camino denominado Camino Real, cuyo medida era de un metro de ancho, este partía de la ciudad de Oaxaca, pasando por Juquila, lugar sagrado actualmente Tataltepec, atravesando medio poblado de Tututepec, Jamiltepec, Pinotepa y culminándose en el pueblito de Acapulco.
>
> 1580: Melchor, the son of the king Pedro de Alvarado, recovered his Pacific Coastal properties, …one of which was Tataltepec, then known as ``Sacred Place", characterized by its gigantic abandoned mountains where only the sounds heard were those of birds, great waterfalls, and the howling of dangerous animals. […] Through the aforementioned place passed a road called the Royal Road, which measured a meter wide, this road left the city of Oaxaca, passed by Juquila, the holy place now known as Tataltepec, crossed through the

meaning 'grandfather hill'. This is arrived at by analyzing *Tataltepec* as *tata-l-tepe-c* (grandfather-EUPH-mountain-LOC). This may be a modern re-analysis as Karttunen (1983, 214) gives Nahuatl *tātahhuē(i)* (lit. 'old father') and Nahuatl *cōli* for 'grandfather', and Nahuatl *tātah* as a term for 'father' that is "widespread in modern Nahuatl"; 'mountain' and the locative suffix are given in the same source as Nahuatl *tepē-tl* and *-c(o)*. The *l* found in the name is considered epenthetic or euphonic. Interestingly, there is another community known as Tataltepec in Oaxaca: the Mixtec-speaking Santa María Tataltepec in the Tlaxiaco district known to its residents as *Yuku Kesi* ('sand mountain') or *Yuku Iñi*. This community favors a different etymology for its Nahuatl-derived Spanish name: 'fire hill' (*tlatla* 'burn' + *tepe(-tl)* 'mountain, hill' + *-c(o)* 'LOC').

It is not entirely clear whether the Nahuatl name is intended to be a calque of its Chatino name or (given that Tataltepec was subject to the Yuku Dzaa empire) its Mixtec name. It is entirely possible that the community's Nahuatl name was assigned from afar and with little awareness of its local name.

The Nahuatl name was adopted as the Spanish name of the village, which is frequently realized hypocoristically as *Tata*. Before 1936, when the village received its *de Valdés* "surname" to honor Antonio de Valdés, resident and hero of the 1811 Seige of Chacahua, the community was named for the patroness assigned to the community by the Spaniards, the Virgin of the Assumption, and was known Santa María Tataltepec (Martínez Gracida, 1883) or Santa María Asunción (Instituto Nacional de Estadística y Geografía, 1900).

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middle of the town of Tututepec, Jamiltepec, and Pinotepa, ending in the little town of Acapulco.

Smith (1973) reports that the name of this village in Coastal Mixtec topolects is *Ñuu Kisi* or *Ñuu Kichi*. The first portion of these names is a toponym generic meaning 'town' or 'land', and the etymology of the second element is uncertain. If both these names are Coastal Mixtec languages which behave similar to the data presented in Josserand (1983), and the forms are cognate, then the <s>:<ch> correspondence suggests that this name would be a reflex of Proto-Mixtec *kixi.[12] This putative reconstruction is segmentally identical to an etymon meaning 'will come' (Josserand, 1979, 470) though it seems unlikely that Mixtec speakers referred to Tataltepec as 'The town will come' (most Mixtec toponym specifics I am aware of are either nouns or adjectives). This Proto-Mixtec *kixi is most likely a homophone of 'will come', or is a distinct lexeme with a different lexical tone. In no Mixtec lexicon I have consulted (from Coastal Mixtec and beyond) has a reflex of proto-Mixtec *kixi had a meaning besides 'come'.[13]

1.2.5.1 The sociolinguistic situation in Tataltepec de Valdés

Tataltepec Chatino appears to have no prominent dialectal variation within its community of speakers. All of the speakers consulted for this study lived within Tataltepec de Valdés proper and it is possible that outlying settlements may feature distinct dialects of Tataltepec Chatino.[14] I am similarly unaware of any sociolinguistic variation within Tatal-

[12] In Josserand's reconstructions, *x represented a dorsal fricative. The <s> reflexes would belong to the topolects of San Agustín Chayuco, Santa María Acatepec or possibly San Cristóbal Chayuco (where the cognate sound is [θ]), whereas the <ch> reflexes (presumeably [tʃ]) would be found in all other Coastal Mixtec topolects, including San Pedro Tututepec, which is quite close to Tataltepec.

[13] To wit: San Agustín Chayuco Mixtec (Pensinger, 1974), San Juan Colorado Mixtec (Sara Stark & Lorenzo Cruz, 1986), Xochapa Mixtec (Stark, Johnson, & González Guzmán, 2003), and Santiago Yosondúa Mixtec (Beaty de Farris et al., 2004).

[14] I am not aware of any such places. Beyond the long-established towns of Tataltepec and Tepenixtlahuaca (where an Eastern Chatino topolect is spoken), all other settlements within the municipality have

tepec. When speakers comment on inter-speaker differences in lexicon or morphology, the differences are generally ascribed to idiolectal differences or familial quirks and not to some more general division in the population.

Spanish is the dominant language in all public domains in Tataltepec de Valdés, excepting for conversation between Chatinophones.[15] Unlike other Chatinophone communities of the region, the loudspeakers used for official municipal announcements and paid messages broadcasts only messages in Spanish, never Chatino. Spanish is the language of governance, but Chatinophone officials will chat with one another in Chatino in the government buildings if no Spanish monolingual overhearers are present. Tataltepec, like many indigenous communities of Mesoamerica, is governed in part by a civil-religious hierarchy (or *cargo* system) similar to those described by Bartolomé and Barrabas (1996) and Greenberg (1981) for some Eastern Chatino speaking communities. One of the features of this system in Chatino communities is a yearly ceremony ratifying the installation of new appointees. In other Chatino communities, these ceremonies are accompanied by elaborate and impressive displays of extemporaneous Chatino oratory (H. Cruz, 2014), but in Tataltepec de Valdés, these display of ritual oratory have been replaced by commemorative speeches in Spanish.

The residents of Tataltepec are aware that fewer people are speaking Chatino today

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been settled quite recently. The earliest of these settlements, El Ocote (widely known as El Ocote o La Palma) was not listed in the 1910 census, but was listed as a *ranchería* under the purview of Santa Cruz Zenzontepec in 1921 (around which time, the Zenzontepec Chatino-speaking Santa María Tlapanalquiahuil also transferred to Zenzontepec's municipality). Only 86 of the 741 (11.6%) persons in the municipality living outside of the towns of Tataltepec and Tepenixtlahuaca proper are reported as speaking some indigenous language.

[15]Much of this discussion of the sociolinguistic situation of Tataltepec de Valdés is taken from (Villard & Sullivant, in press).

than in the past, and some Chatinos blame parents for not teaching their language to their children or blame children for choosing to not speak Chatino. While it may be premature to say that there is a general feeling of nostalgia for Chatino in Tataltepec (especially since anyone in a household with more than one older Chatinophone will hear quite a lot of Chatino), there are some signs that this nostalgia is beginning. During my field trips to Tataltepec de Valdés, a number of public events featured young Chatinos (who are typically semi-speakers of Chatino learners) using Chatino in emblematic ways. In one instance, a chorus of Chatino learners dressed in traditional attire sang a Chatino version of the Mexican national anthem (translated by Tataltepec language activist Flavia Mateo) and in another instance, young women were asked to introduce themselves and answer a few questions in Chatino as part of a *Reina Chatina* 'Chatino Queen' beauty pageant. Events such as these suggest that speaking Chatino is no longer taken for granted among the Chatinos of Tataltepec, who increasingly view even relatively mundane proficiency of Chatino as notable and worthy of praise.

Though there is evidence that the Tataltepec Chatino speech community was multilingual in the past (including lexical and syntactic influence from Coastal Mixtec (E. Campbell, 2013a; Sullivant, 2011c)), today nearly every adult Chatino speaks Spanish in addition to any Chatino they may speak, whereas *mestizo* knowledge of Chatino is effectively nil. Though topolects of each of the three identified subgroups of Chatino can be heard in Tataltepec,[16] Tataltepec-Chatino-speaking residents generally do not speak or under-

[16]Zenzontepec-Chatino-speaking residents from Llano Víbora or Santa María Tlapanalquiahuitl frequently pass through Tataltepec either on their way to the Pacific Coast or to do wage labor in Tataltepec itself. The Eastern Chatino of Santa Cruz Tepenixtlahuaca can be heard when residents of that town travel to Tataltepec for municipal business or commerce.

stand Zenzontepec or Eastern Chatino, except for those who have lived for a time in other Chatino communities.

Spanish is the language of education, though parents can elect to send their children to the bilingual primary school Porfirio Díaz. Like many so-called bilingual schools in Mexico (which have their origins in assimilationist projects (Comas, 1953; Coronado Suzán, 1992; Despagne, 2013)), this school features classes entirely in Spanish, with periodic lessons on the local indigenous languages asking children to memorize the spellings of different Tataltepec Chatino words. Education in Chatino does not continue past primary school, and is not offered in the secondary and high schools in Tataltepec de Valdés.

1.2.5.2 Language vitality

Tataltepec Chatino is spoken primarily in Tataltepec de Valdés, a small town of some 2600 residents. Unlike many rural Mexican communities where an indigenous language is spoken, the community is ethnically divided between Chatinos and mestizos.[17] According to the widely agreed-upon local history, *mestizo* immigrants began arriving in Tataltepec about a century ago.[18] With time, many of these Spanish speakers and their descen-

[17] *Mestizo* is a cultural label commonly taken to refer to people born of mixed, typically Indigenous and European, ancestry (Fernando Lara, 2010; Real Academia Española, 2001). *Mestizo* is used among the ethnic Chatinos of Tataltepec de Valdés to refer to persons who neither identify as Chatino nor are identified as Chatino. This includes people without any Chatino ancestry as well as people with some Chatino ancestry who neither speak Chatino, identify with Chatino culture, nor are identified as Chatino through parentage. This usage reflects the Tataltepec Chatino translation of *mestizo* as *nkú? ^{0}xaà?* litterally, `the different people'. While Chatino is an ethnolinguistic identity, in Tataltepec today there are many monolingual Spanish-speaking children of Chatinophone parents who are considered Chatino by many (if not most) people familiar with their families.

[18] This chronology is supported by early census data. Tataltepec was identified as a "*república de indios*" or an autonomous indigenous community in the mid eighteenth century (Villaseñor y Sánchez, 1746), but by 1900, 153 of its 833 residents (18%) were identified as Spanish speakers (Instituto Nacional de Estadís-

dants came to dominate Tataltepec's political and economic activities, including much of the retail activities of the town. As a result of this early influx of non-Chatinos, Chatinophones today in Tataltepec de Valdés are in the minority in every age cohort, as can be seen in Figure 1.8 and Table 1.1, where Chatinophones in each age cohort (almost entirely Chatino-Spanish bilinguals) are identified in blue, and non-Chatinophones (mostly Spanish monolinguals) are identified in orange; age range of speakers (as of 2012) are given on the y-axis.[19] Note that Chatinophones make up between one-fifth to one-third of the population for all age cohorts age 20 and older. The younger cohorts are rapidly less likely to be Chatinophone. While more fine-grained data looking at the degree of Chatino proficiency would likely suggest that the language shift began earlier, a crucial inflection point in the shift appears to have happened around 1992.

The proportion of Chatinophones as part of the entire population is relatively stable for older generations, as age cohorts born before 1993 or so are between one-quarter and one-third Chatinophone, and cohorts born after 1993 having many fewer Chatinophones. The absolute number of Chatinophones in each cohort also declines around this same time, with the current generation of primary-school-age children having few, if any Chatinophones.

Census data also reports speakers of indigenous languages by age for the entire mu-

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tica y Geografía, 1900).

[19]This chart was prepared by asking one of my primary Chatino consultants and well-known Tataltepec citizen Flavia Mateo to consult a census list prepared by the town's medical clinic and identify all persons know to her as Chatinophone. Given the relatively small population of the town, Mateo's lifelong familiarity with the people of Tataltepec, and the census list's family-by-family organization, I consider the possibility of undercounting Chatinophones to be unlikely. Since no explicit instructions were given as to what Chatino skills were sufficient to be identified as Chatinophone, it is more likely that this figure overcounts the number of fluent Chatino speakers in Tataltepec.

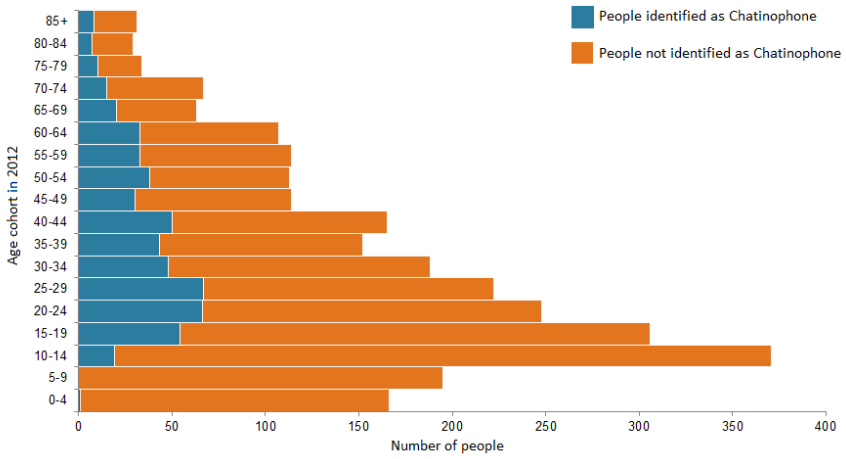

Figure 1.8: Age pyramid of Chatinophone and non-Chatinophone residents

nicipality of Tataltepec de Valdés, as reported in Figure 1.9. Since this figure includes the populous Tepenixtlahuaca, whose Eastern Chatino topolect is quite vital, this figure is less useful for identifying the viatlity of Tataltepec Chatino. Monolingual speakers of an indigenous language (almost exclusively Chatino) are in blue, persons who speak both an indigneous language and Spanish are in orange, and Spanish speakers who know no indigenous language are reported in gray.

During all my visits to Tataltepec de Valdés, I have only met one monolingual Tataltepec Chatino speaker, an elderly woman whose name I regrettably failed to note. When asked about how many monolingual speakers of Tataltepec Chatino lived in the town, Tataltepec residents' responses varied from "none" to an indeterminate "one or two". The high number of speakers (2640) and of monolingual speakers (470) given in Lewis et al. (2013) is due to an oversight in the interpretation of the 2000 census data (Instituto Nacional de Estadística y Geografía, 2000). Numbers of monolingual speakers are reported by *municipio*, and the *municipio* of Tataltepec de Valdés includes not only Tataltepec, but

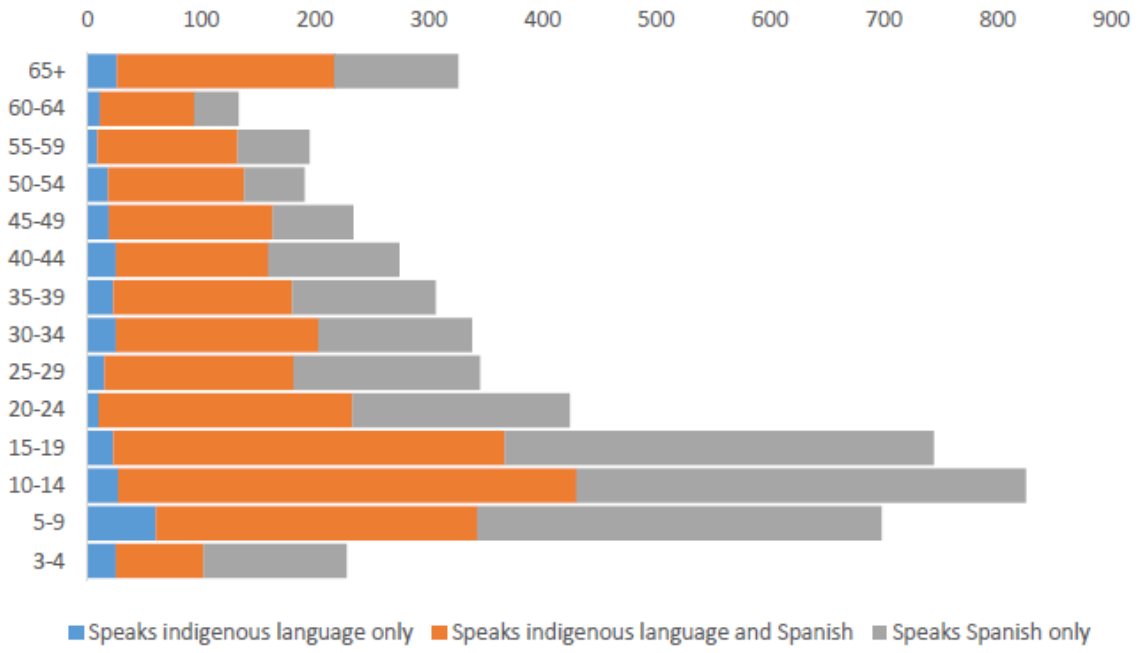

Figure 1.9: Speakers of indigenous languages and Spanish in Tataltepec municipality according to age (Instituto Nacional de Estadística y Geografía, n.d.)

2012 age cohort	Is Chatinophone?		% Chatinophone
	Yes	No	
85+	8	23	25.8
80-84	7	22	24.1
75-79	10	24	29.4
70-74	15	52	22.4
65-69	20	43	31.7
60-64	33	74	30.8
55-59	33	81	28.9
50-54	38	75	33.6
45-49	30	84	26.3
40-44	50	115	30.3
35-39	43	109	28.3
30-34	48	140	25.5
25-29	67	155	30.2
20-24	66	182	26.6
15-19	54	252	17.6
10-14	19	352	5.1
5-9	0	195	0
0-4	0	165	0

Table 1.1: Number of Chatino speakers according to age cohort

Santa Cruz Tepenixtlahuaca, where an Eastern Chatino topolect is spoken. Thus, most of these speakers (and nearly all of the monolingual speakers) are Eastern-Chatino-speaking Tepeños, not Tataltepec-Chatino-speaking Tataltepecanos. My own investigation (summarized in Figure 1.8 above) identified only 541 persons who had any level of skill in Chatino. The number of Eastern-Chatino-speaking residents of Tepenixtlahuaca would then amount to around 2099 persons (82% of its 2010 population) and nearly 470 monolinguals (22% of the Chatinophone population). These figures appear appropriate for Tepenixtlahuaca since the Eastern Chatino topolect spoken there is extremely vibrant.

Tataltepec Chatino is currently the most endangered Chatino language (*sensu* E. Camp-

bell (2013a)), though some topolects of Eastern Chatino such as Zacatepec Eastern Chatino have smaller, older speaker bases (Villard & Sullivant, in press), and some places where Zenzontepec Chatino is spoken (such as Santa Cruz Zenzontepec proper, La Aurora, and El Cucharal) are in the advanced stages of shift to Spanish (E. Campbell, 2014, 12).

1.3 Typological profile of Tataltepec Chatino

Tataltepec Chatino is a Mesoamerican language, and shows traits both diagnostic of and associated with the Mesoamerican Language Area (L. Campbell, Kaufman, & Smith Stark, 1986). The diagnostic traits it possesses include relational nouns (many derived from body parts), a vigesimal numeral system, non-verb-final basic word order (VSO), and some widespread calques.[20] Other traits common to Mesoamerican languages that Tataltepec Chatino exhibits include the absence of nominal number marking, incorporation of body-part terms in some verbs, a clusivity distinction, the absence of a verb meaning 'to have', and several of the semantic calques which are common, but not diagnostic of Mesoamerican languages.[21]

Like all Otomanguean languages, Tataltepec Chatino is a tonal language. Tataltepec Chatino's tone system is a level tone language, with both low, high, and superhigh tone targets and more complex gestures involving rises and falls associated with a single surface realization of a lexical tone. Lexical tone sequences, which are built of zero to two

[20] To date, 'knee: head of leg', 'wrist: neck of hand', 'edge: mouth', 'finger: child of hand', and 'porcupine: thorn animal' have been identified. Of course, some of these, especially 'porcupine: thorn animal' are widespread outside of Mesoamerica, and by themselves are not strong evidence of areality.

[21] These include 'door: mouth of house', 'eye: fruit/seed/bean of face', 'bile: bitter', 'branch: arm of tree', 'to marry: to join, to find', 'eclipse: eat the sun/moon', 'poor: orphan', and 'medicine: liquor, poison'.

tones are associated with stems and expressed across moras, with monomoraic stems featuring distinct surface forms of lexical tones than bimoraic or larger stems. One of the tones that may be part of a tone sequence is a superhigh rising tone (0) which can either be linked (as in /0/ and /0L/) or unlinked (as in /0-X/ and /0-L/). This unlinked tone is linked only if preceded by an /L/ or /H/ tone, and otherwise is unrealized. When the /0/ is linked, it is realized on the same stem that it was associated with, unlike most other instances of "floating" unlinked tones which are realized later in the utterance (Cahill, 2008). Within Chatino, Tataltepec Chatino's tone system appears somewhat more complex than Zenzontepec Chatino's but contains many fewer tone classes and tone levels than have been analyzed for many Eastern Chatino topolects.

Like many Otomanguean languages, Tataltepec Chatino has nasalized vowels and laryngeal consonants, though unlike the Zapotec languages, all laryngeal gestures (laryngeal frication and constriction stop) are associated with consonants and not vocalic or prosodic features. The glottal stop is the only consonant which may close a syllable in native vocabulary.

Tataltepec Chatino uses some head-marking and some dependent-marking (*jiʔìn* marking many non-subject NPs) morphology, and is somewhat synthetic, since most nouns are uninflected, but all verbs and many adjectives carry obligatory inflectional morphology. Verbs are obligatorily inflected for aspect/mood, with adverbial particles adding additional, often temporal, information. Inflectional classes are quite complicated, with largely independent morphological classes determining a verb's aspect prefixes and its aspect tonal inflection paradigm, which is partly determined by phonology. Owing to an ongoing historical process of unstressed vowel syncopation and the reductions of the re-

sulting clusters, much of the morphology is fairly highly fusional; verb aspectual prefixes and historic derivational morphology cannot be easily separated from many verb stems, and the non-concatenative morphology used to inflect first- and second-person singular subjects and possessors (which take as their input the verb stem after it has been inflected for aspect) is entirely fusional and cannot be synchronically explained by the addition of a single invariant tonal morpheme.

Tataltepec Chatino features head-initial syntax and a basic constituent order of VSO, which while uncommon cross-linguistically (Tomlin, 1986, 22), is very common among Otomanguean and other Mesoamerican languages. Juxtaposition is commonly used to link clauses, though coordination is also found. Juxtaposition is especially common in the parallelistic frames that is the favored rhetorical style of Chatinophone orators, which is also used from time to time outside of the original oratorical contexts (H. Cruz, 2014). Existential predicates are expressed with postural verbs ('sit', 'stand', 'lie on the ground', etc.). The pronominal system features an accusative alignment with S and A arguments being distinct from O arguments, which may be flagged (when topical) by the relational noun *ji?ìn*, built of a contraction of an S or A pronoun with the relational noun (e.g. *?ma* 'NSUB.2PL' < *ji?ìn+ma*), or a special distinct form (e.g. *?ná* 'NSUB.1SG').

The pronominal system distinguishes between first, second, and third persons and between singular and plural numbers, with a clusivity distinction in the first person plural. There are a few third-person singular pronouns which are distinguished on additional semantic criteria (i.e. *yu* 'human male', *chó?* 'human female', *ní* 'deity, deceased', *nè?* 'animal') and article + demonstrative expressions are commonly used in a pronominal function (e.g. *no wi?* (ART+DEM:AFMN) 'that one').

1.4 Previous research on the Chatino languages

Research on the Chatino languages to date, can be divided into three periods: an initial period lasting until the mid-twentieth century where data is often sparse, poorly transcribed, or associated with little metadata, a middle period lasting until the end of the twentieth century which was dominated by the efforts of missionary-linguists under the auspices of the Summer Institute of Linguistics, and a later period continuing today that is characterized by the collaboration between academic researchers (some of whom are Chatinophone themselves) and Chatinophone speakers trained in linguistic analysis.

1.4.1 Early Mentions

Though the Chatinos have occupied their current territory for centuries, there are few mentions of them by that name in the early colonial period. Perhaps the earliest mention of the Chatino language dates from the records of the 1635 trial of Diego Luis of Santa Ana Sola who was accused of idolatry for possessing and distributing a Soltec translation of a ritual text given to him in Chatino (Tavárez, 2011, 115). None of the *Relaciones Geográficas* concern what is now the Chatinophone region, but some of these communities are briefly ennumerated in an eighteenth-century geographic questionnaire (Villaseñor y Sánchez, 1746). Spaniards of the early colonial period either mistook the Chatinos for Mixtecs or otherwise did not mention them (Gay, 1881). Confounding the matter further, Papabuco seems to have been labeled as Chatino in some instances (Martínez Gracida, 1883).[22] Unlike with Mixtec and Zapotec, there are no known surviving letters, wills,

[22] This misapprehension continued into the later works of Swanton (1951, 630) and hence B. W. Upson and Longacre (1965).

deeds or catechisms written in Chatino from the colonial period.

Belmar (1902) presents a large list of vocabulary in an unidentified Chatino topolect[23] that is somewhat inexpertly transcribed, failing to regularly indicate vowel nasalization, stop prenasalization, glottal stops, and all tonal phenomena. A smaller comparative vocabulary list is offered to motivate Chatino's closer affinity to Zapotec rather than to Mixtec and features Chatino forms from Juquila (apparently an Eastern Chatino topolect), Zenzontepec, and Teojomulco (which is a Chatino language even more divergent than Zenzontepec Chatino, and is attested nowhere else (Sullivant, under review)) compared against Tututepec Mixtec and San Gabriel Mixtepec Zapotec, which appears to be a Coatecan Southern Zapotec language (Beam de Azcona, 2014; Sullivant, 2014) and is attested nowhere else.

Mechling (1912) places Chatino in the Zapotecan stock, and mentions that Peñafiel collected vocabularies for the Chatino topolects of San Juan Quiahije, Santa Cruz Tepenixtlahuaca, San Juan Lachao (all Eastern Chatino), Santa María Tlapanalquiahuitl, and Zensontepec [*sic.*] (both Zenzontepec Chatino topolects). Peñafiel's ca. 1886 surveys constitute the oldest Chatino data, though the surveys themselves are known only from Mechling (1912) as the originals appear to have been lost. Mechling also provides a short vocabulary list of an unidentified Chatino language to motivate the relationship of Zapotec, Soltec, and Chatino through lexical similarity.[24]

[23]This may actually contain forms from more than one Chatino language as <nobi> and <noca> are both given as possible forms of the distal demonstrative/pronoun 'that one' while all extant topolects either feature forms like Tataltepec Chatino *no wiʔ* or Quiahije Eastern Chatino *no kanq-g* but not both, though the bulk of this data appear to represent an Eastern Chatino topolect.

[24]Though this vocabulary list appears to be Chatino, some of the transcriptions are difficult to relate to extant Chatino topolects, and some transcriptions, such as <tacua> 'four', which has an initial dental stop

As mentioned in §1.2.2 above, Boas (1913) identified Tataltepec Chatino as a "dialect" of Chatino, and he (relying on his informant Ezéquiel Vásquez) is also the first to highlight the distinctness of the Tataltepec Chatino topolect from all other forms of Chatino, and identifies it as the lone member of the "second dialect" of Chatino. Boas also described Chatino as related to Zapotec based on surface similarities of independent pronouns and other vocabulary. E. Campbell (2013a) describes Boas's Chatino data, and considers Zacatepec Eastern Chatino or a similar topolect to be represented by Vásquez's speech.

Angulo (1925) when comparing vocabulary and morphology of the languages of Oaxaca, identifies a similarity between Chatino and Zapotec, but does not demonstrate this relation and suggests that the similarity may be the result of language contact.

1.4.2 Mid-Century Missionaries

The second wave of Chatino language research began with the arrival of missionary linguists under the auspices of the Summer Institute of Linguistics (SIL) / Wycliffe Bible Translators beginning in the 1950s. In spite of the rather narrow official goal of translating the Christian New Testament into Chatino, a great deal of scholarship was produced, beginning with a vocabulary of Nopala Eastern Chatino (H. P. McKaughan & McKaughan, 1951). H. McKaughan published a description of Yaitepec Eastern Chatino phonemes (1954). Jessamine Upson presented a number of riddles to demonstrate Yaitepec morphosyntax (1956), and later offered a treatment of other morphosyntactic phe-

whereas all Chatino languages have [h], could be the result of errors in compilation, transcription, or typesetting.

nomena (1960), and a study of tone and vowel length (1968). Kitty Pride described the Yaitepec numeral system (1961), and Leslie Pride described Yaitepec lexical tone (1963). Kitty Pride produced a detailed study of Yaitepec syntax (1965), which was written in the tagmemic framework, limiting the usefulness of the book.

Billy Upson and Robert Longacre reconstructed 251 lexemes using data from all three Chatino languages (1965), thus providing the earliest extant Tataltepec Chatino data. As mentioned above, following Swanton (1951), they erroneously include Papabuco in their analysis, which is now known to be a descendant of Proto-Zapotec not Proto-Chatino (Suárez, 1973). Though they were able to produce many valid cognate sets, their reconstructed forms are inaccurate in a few respects, such as the lack of any indication of lexical tone and the positing of a length contrast on penultimate syllables.

After moving from Yaitepec, Leslie and Kitty Pride spent many years in Tataltepec de Valdés and produced a bilingual dictionary of Tataltepec Chatino (1970). This vocabulary features about 1300 headwords but is limited in several regards. First, lexical tone is not indicated throughout the work, greatly under-representing the phonology of the language. Second, only three forms are given for most verbs, each glossed by a different tense of Spanish, but Tataltepec Chatino, like other Chatino languages, has four aspect-inflected forms for each verb stem. The completive and potential aspects are well-represented since they are segmentally distinct and correlate strongly with the Spanish preterit and future tenses. A third form (which was glossed by the Spanish present tense) may represent either the habitual or progressive aspects, which in Tataltepec Chatino often differ only by tone. Many verbs with four segmentally-distinct aspect-inflected stems are represented in the dictionary with only three forms. Thirdly, while the orthography correctly repre-

sents the lack of distinction between high and mid back nasal vowels, representing both as <u̲>, it fails to distinguish between the mid-front and high-front nasal vowels, representing both as <i̲>. Apart from these troubles, the vocabulary is fairly sound, and will be invaluable for anyone reading or studying the translation of the Christian New Testament produced using this orthography (La Liga Bíblica, 1981).

Leslie Pride also produced a description of the lexical tones of Tataltepec Chatino, focusing on the contrasts found on the penultimate syllable (1984). While he identified a few of the sandhi patterns later mentioned in Sullivant and Woodbury (2009), the analysis suffers by aligning tones to syllables and not stems, causing the author to fail to notice the unity of a given lexical tone across monosyllabic and disyllabic words, and bringing about a great multiplication of tone categories in the language.

The latest SIL publication on Chatino is a mid-sized dictionary of Panixtlahuaca Eastern Chatino (K. Pride & Pride, 2004) including a series of appendices including a grammatical sketch (K. Pride, 2004). Though tone is indicated throughout this work, later research on the tone system of this topolect has failed to corroborate the analysis of this dictionary and has found additional phonemic vowel qualities not indicated in the dictionary (Woodbury, 2011).

1.4.3 Academic Attention

In 1995, the Project for the Documentation of the Languages of Mesoamerica began research projects on Yaitepec Eastern Chatino and Zenzontepec Chatino. Jeffrey Rasch produced works on Yaitepec phonology (1998b), topics regarding the relational nouns

ʔin (1998a) and *ʔo* (1999),[25] as well as the first modern description of a Chatino language (2002). Troi Carleton compiled a lexical database of Zenzontepec Chatino later built upon by Eric Campbell and published as a Chatino-Spanish dictionary (E. Campbell & Carleton, in press), as well as producing works on Zenzontepec Chatino pronominal marking (Carleton & Waksler, 2000), syntax and semantics (Carleton & Waksler, 2002) and topic marking (Carleton, 2002). The data reported in Carleton and Waksler's works have since been reanalyzed by Dalrymple and Nikolaeva (2011), whose analysis is endorsed and adopted by E. Campbell (2014) in his detailed description of Zenzontepec Chatino phonology and morphology.

The Chatino Language Documentation Project (CLDP) (E. Cruz & Woodbury, 2014a), is a research program began as collaboration between Emiliana Cruz and Anthony Woodbury on Quiahije Eastern Chatino, that expanded to include research on all three Chatino languages, including surveys of many Eastern Chatino topolects and long-term in-depth research of three. Eric Campbell focused on Zenzontepec Chatino, Stéphanie Villard on Zacatepec Eastern Chatino, Hilaria Cruz and Emiliana Cruz on Quiahije Eastern Chatino, and Justin McIntosh on Teotepec Eastern Chatino. I worked on the documentation of Tataltepec Chatino.

The CLDP has helped refine the internal classification of the language (E. Campbell, 2013a; Woodbury, 2009). E. Campbell and Cruz (2009) wrote about the numeral system of Proto-Chatino. Other comparative works include works on the comparative tonology with an eye to reconstructing the tonal phonology of Proto-Chatino (E. Campbell &

[25] These are cognates of Tataltepec Chatino's *jiʔìn* and *loʔó*, respectively.

Woodbury, 2010), and morphosyntax (E. Cruz, Cruz, Figueroa, et al., 2010).

A sizeable amount of the research of the CLDP has focused on phonology, especially tonal phonology of Eastern Chatino languages (E. Cruz, 2004, 2011; E. Cruz & Woodbury, 2005, 2006; H. Cruz & Woodbury, 2006; McIntosh, 2009, 2012; Villard, 2007), experimental and computational tests of these phonological analyses (John, 2009; Sullivant, 2011b); the phonology of Tataltepec Chatino (Sullivant, 2011b; Sullivant & Woodbury, 2009), and works discussing the methodologies involved in such tone investigations (E. Cruz & Woodbury, 2014b). Other works have focused on specific topics of morphosyntax and semantics such as the distinction between alienable and inalienably possessed nouns (E. Cruz, 2007), ethnobotany (E. Campbell, 2007), complementation (E. Cruz, Cruz, Cruz, & Smith Stark, 2008), verbs of motion (H. Cruz & Woodbury, 2007), properties of adjectives (E. Cruz & Woodbury, 2009), poetics and ritual speech (H. Cruz, 2009, 2014), existential verbs and copula (McIntosh & Villard, 2011), and the demonstrative systems of different Chatino languages (E. Cruz & Sullivant, 2012).

The morphological verb aspect inflection classes have been investigated for Zenzontepec Chatino (E. Campbell, 2011), and this framework has been applied quite successfully to Zacatepec Eastern Chatino (Villard, 2009) and Tataltepec Chatino (Sullivant, 2011a). Grammatical sketches have been prepared for the Eastern Chatino topolects of Zacatepec and Teotepec (McIntosh, 2011; Villard, 2008).

Dictionaries of Zenzontepec Chatino and Yaitepec Eastern Chatino have been published (E. Campbell & Carleton, in press; Rasch & Suárez Martínez, in press).

Other studies of linguistic behavior in Chatinophone communities, though not re-

search on Chatino itself include cross-cultural psycholinguistic experiments on child language acquisition performed in part in Santa Lucía Teotepec (Klinger & Bannard, under review), and documentation of and research on an emergent sign language in San Juan Quiahije and Cieneguilla de Quiahije tentatively labeled Chatino Sign Language (CSL) focusing on the development of its lexicon through the contributions of conventionalized gestures in Quiahije and on the child acquisition of signs (Hou & Mesh, 2014).

Tataltepec Chatino data has been used in a few papers. In most cases, these papers draw their data from K. Pride and Pride (1970), without corroboration from fieldwork or texts. While it is not the purpose of this paper to talk about the suitability of many of these arguments, one paper makes specific claims about Tataltepec Chatino's influence on a nearby Spanish variety to which I can respond.

Rosas Mayén (2007) claims that the Spanish spoken by Afro-Mestizo communities of the Costa Chica (Costa Chica Spanish (CCSp)) demonstrates a notable lexical influence from indigenous American languages in addition to the influences visible from the substrate of African languages present in the community. While the identified loans from Nahuatl and Caribbean languages likely entered CCSp via other regional Spanishes, the purported loans from nearby Mixtec and Chatino languages are more likely to reflect genuine language contact with these groups. Rosas Mayén identifies 7 Mixtec loans,[26] some of which (*endoco* 'king prawn' and *tichinda* ∼ *tixinda* 'clam' or 'mussel'[27]) are also present

[26]However, one of these, *cuche* 'pig' is not a loan from Mixtec *cūxí*, but rather is derived from a Spanish vocative for pigs (Bright, 1976).

[27]Cf. San Juan Colorado Coastal Mixtec *tindòcò* [ti.^{n}do.ko] '*langosta*' (either a locust or a large prawn) and *tijindà* ∼ *tixindà* ∼ *tiindà* [ti.hi.^{n}da] ∼ [ti.ʃi.^{n}da] ∼ [ti.i.^{n}da] 'mussel, purple'. (Sara Stark & Lorenzo Cruz, 1986)

in the non-Afro-Mestizo Spanishes of the area and also identifies 3 purported loans from (Tataltepec) Chatino, *chuquía* 'stinking', *chole* 'turkey', and *chita* 'nest', each of which I will show to not be loans from any attested Chatino language.

Rosas Mayén presents *chuquía* or *choquío* ("the strong smell emanated from some animals like fish or iguana") as a lexeme peculiar to CCSp that is derived from TAT *tykón* [tʃkõ] 'smell of a rotting animal' which appears in K. Pride and Pride (1970) as <tyucu̲>. This lexeme is actually not restricted to CCSp: while appearing in no dictionary I have consulted, the term is known throughout Mexico. Furthermore, the actual term for the "*chuquía*" odor (a foul smell strongly associated with rotten eggs, unwashed dishes, and fish) is not *tykón* but *chaʔà* in Tataltepec Chatino, and both [tʃkõ] and [tʃᵃʔa] are unlikely sources for *chuquía* [tʃu.ki.a]. Additionally, *chuquía* is thought to have a Nahuatl source, *xoquializtli* 'olor fétido, sofocante, hedor' (Siméon, 1983).

CCSp is also said to demonstrate a Chatino influence in its term *chole* 'turkey', based on the Chatino form *kolo*. This *kolo* form is also widespread among other indigenous languages of Mexico and may be sound symbolic or a widely distributed areal word. It is also hard to imagine why a /k/ would be affricated to /t͡ʃ/ in this borrowing. A Nahuatl source, perhaps related to *huexōlō-tl* 'tom turkey' (the source for Sp. *guajolote* 'turkey') is most likely.

CCSp *chita* 'nest' is said to be a loan from TAT *xatén*, which appear in K. Pride and Pride (1970, 29) as <xati̲> via vowel metathesis. This is not a likely Chatino loan since this form [ʃa̱tẽ̱], as well as the common variant *xlyatén* [ʃlʲa̱tẽ̱] or ZEN *nyátę* [nʲatẽ] are the sources of the CCSp [tʃita] form which is entirely oral. Furthermore, the only other instances of metathesis Rosas Mayén describes are consonant methathesis (*pared* 'wall'

→ [paɻ̩er]) and the rearrangement of adjacent vowels (*ciudad* 'city' → [swiɻ̩a]), both of which convert otherwise anomalous sequences (rVd#, Ciu) to statistically far more common ones (dVr#, Cui). This cannot be the motivation for a methathesis of vowels of the syllables of a word, and it is unlikely that one of those vowels would have been heard as /i/ rather than /e/ or as an /en/ sequence. While I cannot identify a likely non-Chatino source for CCSp *chita*, I am certain it does not derive from Tataltepec Chatino.

1.5 The research for the present study

The data used in this dissertation are taken from my own research in Tataltepec de Valdés from 2009 to 2012. The bulk of my research activities was devoted to the collection, transcription, and translation of natural Tataltepec Chatino discourse, with paired goals of creating a record of the language while it is still spoken by people who consider it their primary language and providing myself with enough data to create a description of the grammar of the language. The resulting corpus contains a little over 20 hours of audio recordings where one or more people are speaking Tataltepec Chatino. The genres included in the recordings are personal histories and recollections, folk tales, procedural texts, descriptions of local customs and governance, geographical descriptions, advice-giving and dialogues.

These texts were recorded in Tataltepec de Valdés by myself, or other researchers associated with the CLDP (specifically, Anthony Woodbury, Eric Campbell, Hilaria Cruz, and Emiliana Cruz). These recordings were made through the support of a major project grant from the Endangered Language Documentation Programme at the Hans Rausing Endangered Languages Programme at the School of Oriental and Asian Studies at the

University of London (MDP0153), and later by a dissertation improvement grant through the Documenting Endangered Languages program of the National Science Foundation (BCS-1065082).

Early in this project, I benefited from the assistance of Alicia Martínez Quiroz, who had been trained in linguistic analysis through the PDLMA. Beyond her help with linguistic matters, she also was invaluable in finding potential collaborators for this project. In these early stages a large amount of assistance was given by schoolteacher Jesús Jiménez Jiménez, who is a supporter of Chatino education, and had participated in earlier attempts to produce a Chatino orthography (Molina Cruz et al. 2011). The team of collaborators also included Modesta Martínez Mateo and Cecilia López Mejía who worked long hours to translate and transcribe the collected texts.

Flavia Mateo Mejía, born 1950, is a retired schoolteacher who has been quite interested in Chatino for some time. When teaching Zenzontepec-Chatino-speaking schoolchildren in communities such as Llano Víbora, she learned to speak that language. Before that, she had participated in the linguistic research of Leslie and Kitty Pride, missionary-linguists from the Summer Institute of Linguistics who lived in Tataltepec for some sixteen years in the sixties and seventies. She has participated in an initiative by the Center for the Study and Development of the Indigenous Languages of Oaxaca (CEDELIO) to translate and record the Mexican national anthem into various indigenous languages. She is recognized within the community for her Chatino skills, and over the years has been asked to teach Tataltepec Chatino to schoolchildren and to prepare a chorus of heritage Chatino speakers to sing the anthem at public events. She worked closely with the CLDP linguists during their 2008 and 2009 visits to Tataltepec, and has worked closely with me

since I began my fieldwork in the community, teaching me her Chatino and working with me to transcribe and translate the texts collected throughout the community.

Celiflora Cortés Jiménez, born 1981, is a part-time schoolteacher who has worked with me during most of my field sessions. Through her work with the bilingual school, she took an interest in writing and noticed that the orthography commonly used by the schools (a derivation of the orthography of Hernández López and Julián Caballero (1992) and Molina Cruz et al. (2001)) underrepresented Tataltepec Chatino's phonology, and wanted to learn how to better capture her language in writing. We worked together to troubleshoot and develop some revisions to the extant orthography, which Cortés adopted. Since my last visit to Tataltepec de Valdés, she has continued to study Tataltepec Chatino, and has traveled to Oaxaca to participate in a June 2014 lexical tone workshop organized by Emiliana Cruz.

1.6 Orthographies

A few different orthographies are used throughout the course of this dissertation: a practical orthography (§1.6.1) meant to represent phonological forms while abiding by common Mesoamerican transcription traditions, highlighting similarities to other Chatino orthographies, and the reducing the complications of typing and interpreting the symbols on common keyboards; an entirely phonemic orthography (§1.6.2) based on the International Phonetic Alphabet (IPA) which clarifies the phonological structure encoded in the practical orthography; and a phonetic orthography (§1.6.3) also based on the IPA specifying the typical phonetic productions of a given lexeme. This section will also briefly discuss local orthographic practices (§1.6.4) and the conventions used for linguistic exam-

ples (§1.6.5) in this work.

Table 1.2 compares the phonemic symbols representign segments used in this description alongside the symbols used to indicate these in the practical orthography of this volume, and the phonetic symbols each phoneme's allophones are transcribed as. Table 1.3 presents the practical orthography and the phonemic orthography's representations of tone sequences.

1.6.1 Practical orthography

The practical orthography employed in this work is an orthography that follows many of the conventions common in Mesoamerican linguistics, which are in turn borrowed from colonial-era Spanish (e.g. <x> for a post alveolar fricative) or from contemporary Spanish conventions (e.g. <j> for a fricative produced in the back of the vocal tract). The practical orthography is set in italics throughout the text, and is accompanied where relevant with phonemic orthography in slashes (//) and/or phonetic transcriptions in square brackets ([]). The consonant symbols used in the practical orthography are given in Figure 1.10.

	Labial	Dental	Laminal	Velar	Labialized velar	Laryngeal
Stops	*p*	*t*	*ty*	*k*	*kw*	*ʔ*
Affricates		*tz*	*ch*			
Fricatives	*f*	*s*	*x*			*j*
Nasals	*m*	*n*	*ny*			
Glides	*b w jw*		*y jy*			
Tap		*r*				
Lateral		*l*	*ly*			

Figure 1.10: Practical orthography of Tataltepec Chatino

Practical	Phonemic	Phonetic
ʔ	/ʔ/	[ʔ]
j	/h/	[h]
k	/k/	[k], [ɡ]
kw	/kʷ/	[kʷ], [ɡʷ]
jy	/j̥/	[ç]
y	/j/	[j], [ç]
t	/t/	[t], [d]
tz	/t͡s/	[ts]
n	/n/	[n]
s	/s/	[s]
l	/l/	[l], [ɬ]
r	/ɾ/	[ɾ]
ty	/tʲ/	[tʲ], [dʲ]
ch	/t͡ʃ/	[tʃ]
ny	/nʲ/	[nʲ]
x	/ʃ/	[ʃ]
ly	/lʲ/	[lʲ]
p	/p/	[p], [b]
m	/m/	[m]
w	/w/	[w], [β̞], [ɸ]
jw	/(h)ɸ/	[(h)ɸ]
b	/β̞/	[β̞]
f	/f/	[f], [(h)ɸ]
a	/a/	[a], [a̟]
an#	/ã/	[ã]
e	/e/	[e]
en#	/ẽ/	[ẽ̟]
i	/i/	[i]
in#	/ĩ/	[ĩ]
o	/o/	[o]
on#	/õ/	[õ]
u	/u/	[u]

Table 1.2: Comparion of practical, phonemic, and phonetic orthographies for segments

Practical	Phonemic
a	/a$^{\mathrm{X}}$/
á	/a$^{\mathrm{H}}$/
à	/a$^{\mathrm{L}}$/
ǎ	/a^{0}/
ā	/a$^{\mathrm{H\widehat{L}}}$/
^{0}...*a*	/a$^{0\text{-}\mathrm{X}}$/
^{0}...*à*	/a$^{0\text{-}\mathrm{L}}$/
â	/a$^{0\mathrm{L}}$/

Table 1.3: Comparion of practical and phonemic orthographies for tone sequences

Some deviations from the International Phonetic Alphabet and common Americanist transcriptions include the use of <x> to represent the voiceless alveopalatal fricative, <j> to represent a laryngeal fricative, <y> to represent a palatal glide and secondary palatalization of a consonant, and <tz> and <ch> to represent the dento-alveolar and palatal-alveolar affricates, respectively. In-line digraphs are used instead of superscripts (i.e. <ty> and <kw> rather than <t^{y}> and <k^{w}>). Unlike many Mesoamerican orthographies, glottal stop is indicated by the symbol <ʔ> rather than the <7> favored by the PDLMA,[28] the <q> recently promoted for Quiahije Eastern Chatino (E. Cruz, 2011), the apostrophe common elsewhere in Mesoamerica, as in most practical orthographies of Mayan or Zapotec languages, or the <h> commonly used in orthographies of the Mixtecan languages spoken to the west of the Chatinophone region. <b> does not represent a stop, but rather a voiced bilabial approximant /β̞/. A doubled vowel symbol indicates a long vowel, and the nasalization of a final vowel is indicated by a <n> placed after that vowel.[29] The vowels themselves are represented by <a e i o u an en in on>.

Tone sequences are indicated in the practical orthography by the presence or absence of a diacritic mark above the final vowel (<a ^{0}…a á à ^{0}…à ā ă â>)and the presence or absence of a superscript <^{0}> before the word.

[28]<7> is also preferred to <ʔ> to represent glottal stop in some Canadian languages such as Squamish (*Sḵwx̱wú7mesh snichim* [sq^{w}χ^{w}uʔməʃsnitʃim] 'Squamish language').

[29]Unlike in the practical orthography of Rasch (2002) and Rasch and Suárez Martínez (in press) for Yaitepec Eastern Chatino, the <n> is placed before not after a word-final glottal stop.

1.6.2 Phonemic orthography

Phonemic orthographies are given between slashes (//) and are provided in chapters detailing phonological structure, and elsewhere where relevant or revealing. The symbols used therein are those of the International Phonetic Alphabet, though some modifications have been necessary such as adding a diacritic indicating lowering (<o̞>) to a bilabial fricative (<β>) to indicate a voiced bilabial approximant /β̞/. Consonant symbols are listed in the chart in Figure 1.11.

	Labial	Dental	Laminal	Velar	Labialized velar	Laryngeal
Stops	p	t	tʲ	k	kʷ	ʔ
Affricates		t͡s	t͡ʃ			
Fricatives	f	s	ʃ			h
Nasals	m	n	nʲ			
Glides	β̞ w w̞		j j̞			
Tap		ɾ				
Lateral		l	lʲ			

Figure 1.11: Phonemic orthography of Tataltepec Chatino

Vowels are represented by the symbols /a e i o u ã ẽ ĩ õ/, and are followed by <ː> to indicate a long vowel.

Lexical tone sequences are not represented with IPA symbols but rather with a superscript indication of the lexical tone sequence following the morphological word ({X, 0-X, L, 0-L, H, H͡L, 0, 0L}). This is done because the realizations of these tone sequences are variable enough that assigning a tone level to each would be misleading or uninformative (the tone sequence /0L/ would variously have phonetic realizations like [ta꜖taꜘ], [taː꜖] and [taꜘ]), and I am not aware of any convenient way to represent unlinked tones with IPA symbols.

1.6.3 Phonetic orthography

Phonetic transcriptions are given where relevant and useful in square brackets ([]). The transcriptions therein are often not transcriptions of a particular token in a specific utterance but rather a transcription of how a typical speaker would pronounce a phonological form in an unmarked context. As a result, these transcriptions are fairly broad, and where intra-speaker variation is common (as with the realization of /VʔV/ sequences) a particular possible realization I judge to be most common and unmarked is selected for all such transcriptions.

Vowels adjacent to nasal segments are usually partially nasalized. Except for cases where a vowel follows a nasal segment in a final syllable, the nasalization is not particularly strong nor produced over the majority of the duration of the vowel. Therefore, coarticulatory nasalization is not indicated except when a vowel follows a nasal segment in a final syllable.

Tone indications are not given in phonetic transcriptions since this information is better expressed by autosegmental representations than by in-line IPA tone marking, and since tone varies by context, which these decontextualized transcriptions of hypothetical typical productions lack.

1.6.4 Local orthography

The first orthography developed for Tataltepec Chatino was that created by SIL linguists Kitty and Leslie Pride, this orthography was used in their dictionary (1970), and was used in the translation of the New Testament into Tataltepec Chatino (La Liga Bíblica, 1981), as well as numerous small pamphlets and booklets produced by the SIL and dis-

tributed within the community and now available online. This orthography is similar to the practical orthography of this volume in its use of doubled symbols to represent long vowels, and the Mesoamericanist values of some symbols (<j> as a laryngeal fricative, <x> as a post-alveolar fricative, <y> to represent a palatal glide or secondary palatalization), but differs in a number of respects. The glottal stop is represented by an apostrophe (which is typeset as a prime) except word-initially, where it is written <h>, vowel nasalization is represented by underlining a vowel, Spanish rules for spelling velar stops are followed,[30] and the alveo-dental affricate is written <ts>. A <w> is not used in this orthography, and /w/ and /β̬/ are both written <b>, with voiceless labiovelars also written as <b> or <jb>. Labialized velars are written <cu, gu, gü> depending on the following vowel's frontness. This use of a vowel symbol to indicate secondary labialization leads to an ambiguity in sequences such as <cula> which could be interpreted as /kula/ or /kʷla/. There is no indication of tone in this orthography, but occasionally one member of a tonal minimal pair is distinguished with an acute accent. The voicing of stops after nasal segments (which my analysis considers allophonic variation) is represented in this orthography, meaning that a sequence such as /nka/ [ŋga] is written <nga>. This orthography, and the phonological structure it presumes is discussed more completely in Chapter 6.

The SIL orthography was largely supported by a 1990 workshop of schoolteachers from around the Chatinophone region (Hernández López & Julián Caballero, 1992; Molina Cruz et al., 2001). This orthography was meant to serve (with some modifications) as a unified orthographic scheme for all Chatino topolects, and neither published work on the

[30]That is [k g] are written <c g> before consonants and non-front vowels and <qu gu> before front vowel symbols, and [kʷ gʷ] are written <cu gu> before consonants and non-front vowels and <cu gü> before front vowels.

orthography details the orthography as it precisely reflects Tataltepec Chatino. It is very similar to the SIL orthography except in a few points: the post-alveolar affricate is written <sh>, /hw/ is written <f>, and /w/ is only written as <b> at the beginnings of words and is <u> elsewhere, even in words like <ja'ua> *^{0}jaʔwa* /haʔwa$^{0\text{-}X}$/ 'banana'. Instead of underlining vowels to indicate nasalization, a diaresis is placed over a vowel. The subphonemic representation of post-nasal stop voicing is continued in this orthography. Glottal stop is represented by an apostrophe. Lexical tone is entirely unrepresented given the assertion that

> [E]s fácil identificar a lo que se refiere en un diálogo o en un contexto determinado; es decir, los propios hablantes se dan cuenta del significado por la entonación que se da la palabra.
>
> It is easy to identify is being referred to in a dialogue or in a determined context; that is, the speakers themselves understand the meaning by the intonation given to the word.(Molina Cruz et al., 2001, 49)

To my knowledge, nothing has been published with this orthography, though it is used in some public uses of Tataltepec Chatino (for example, a series of soccer jerseys were made writing 'Mexico' as *Kichë Chijya'*), and a variation of this orthography is used in local schools.

1.6.5 Conventions for linguistic examples

Linguistic examples are glossed following the conventions expressed in the Leipzig Glossing Rules (Comrie, Haspelmath, & Bickel, 2008). The first line of each example is given in the practical orthography of this work in a plain typeface. Where prefixes can be identified, these are separated from stems by hyphens (-), enclitics are separated from

their hosts by an equal sign (=), and the stems combined in compounds are separated by a plus sign (+). The second line of each example is a morphological gloss where each morpheme is glossed. Lexical meanings are given in plain typeface, with grammatical information provided by abbreviations in small caps. A full list of the abbreviations used in this work can be found in Appendix A. The morpheme divisions of the first line are repeated here. The third line is a free translation of the utterance. I have provided these translations myself taking into consideration the Spanish translations offered by the Chatino-Spanish bilinguals of of documentation team and my own understanding of the meaning of these utterances in Chatino. When helpful or enlightening, a literal translation is offered in addition to the idiomatic free translation. On the third line is also a code indicating the source of the example. If the example is contained in the corpus of natural speech, the code indicates the speaker(s) involved in the recording and its date (a list of the codes involved, with links to archived versions of these recordings where possible, can be found in Appendix B), if the example was elicited or offered, the example will be identified as such on this line as well. Short examples---often involving little more than person inflection---are drawn from my lexical databases which are the product of directed elicitation.

Chapter 2

Suprasegmental phonology

Tataltepec Chatino has a complex suprasegmental inventory with the features of tone, nasality, and length operating on independent tiers, and in similar distributions where distinctions are maximized on stressed, stem-final syllables and are restricted or absent outside of these syllables. Of these three features, only tone will be explicitly represented as operating on a distinct tier in this dissertation, as nasality and length have their domains restricted to particular segments. Nevertheless, since their distributions are similar to that of tone, they are discussed together in this chapter.

This chapter will discuss the autosegmental approach to Tataltepec Chatino phonology which shapes the discussion of the features of vowel length, vowel nasality, and tone. Tone is quite a complex issue and is discussed in detail in Chapter 5, but will be discussed in this chapter along with nasality and length in order to demonstrate the parallels in the distribution of these three features.

2.1 Summary of suprasegmental features

There are three important suprasegmental features in Tataltepec Chatino: vowel nasalization, length, and tone. Nasal vowels occur in stressed, stem-final syllables and in unstressed penultimate syllables only if the following syllable is opened by a single laryn-

geal consonant and itself contains a nasalized vowel. Long vowels occur only in final syllables, and final syllables are the only syllables specified for tone unless the tone class associated with a disyllabic stem contains multiple linked tones, in which case the penultimate syllable will receive the leftmost tonal formative. This distribution of suprasegmental features is summarized in Table 2.1.

Feature	In final σ?	In penultimate σ?
Vowel nasalization	yes	only if /_{h,ʔ}$\tilde{\text{V}}$
Length	yes	no
Tone	yes	only if tone class has two tonal formatives

Table 2.1: Summary of distribution of suprasegmental features

2.2 Stress

All syllables in Tataltepec Chatino are either stressed (σ_S) or unstressed (σ_W). Stressed syllables are always stem-final syllables (that is, word-final unless the stem is followed by one or more enclitics), and stem-final syllables are always stressed.

Stress can have two kinds of effects in: phonological and phonetic. Phonological affects of stress generally affect σ_W in that σ_W cannot be associated with suprasegmental features like length, and vowel nasalization, are only linked to a tone if multiple tones are linked to the stem (ω), and show a restriction in the frequency of mid vowels. Phonetic affects include durational affects in segments and a centralization of certain vowel qualities. Historically, stress has affected what vowels were syncopated, in that many σ_W (especially those in non-root syllables) have been reduced and ultimately lost in Tataltepec Chatino. § 2.2.2 takes up this matter in detail.

2.2.1 Phonological consequences of stress

Tataltepec Chatino and the other languages of Core Chatino (Zenzontepec Chatino and all extant topolects of Eastern Chatino) all share this stem-final stress where disyllabic stems ω are realized as $\sigma_W\sigma_S$.[1] Beyond phonetic affects of stress (including greater durations and intensities of σ_S), there are phonological consequences of stress. Only σ_S can be long or linked to the [+ nasal] feature, while σ_W can only be oral and short. σ_S can contain vowels of any quality, while the vowel qualities of σ_W are limited. Additionally, σ_W are prone to deletion or suffering a syncopation of their vowels in many languages across Zapotecan. The rest of this section will discuss each of these distributional facts for Tataltepec Chatino, with occasional references to similar phenomena in $\sigma_S\sigma_W$ languages of Zapotecan.

2.2.1.1 Only stressed vowels may be long

Only stressed vowels may be long. Other than the absence of unstressed long vowels in the lexicon (*CVVCV), evidence for this restriction comes from compound verbs. An aspect-inflected motion verb may be attached to a verb stem which must be inflected for person. Thus *^{0}tzaa* /t͡sa:$^{0\text{-}X}$/ '$_{P.NB}$go$_{(.3)}$' can be attached to the verb stem *suu* /su:^{X}/ 'pick fruit' to form *^{0}tzasuu* /t͡sa+su:$^{0\text{-}X}$/ ($_{P.NB}$go+pick_fruit$_{(.3)}$) 'will go to pick fruit'. In this verb, the long vowel of *^{0}tzaa* is no longer stressed and has been shortened.

[1] The opposite pattern of stem-initial stress (where disyllabic ω are realized as $\sigma_S\sigma_W$) is present in the non-Core Chatino Zapotecan languages, including the now-extinct Soltec and arguably the extinct Teojomulco Chatino (Sullivant, under review).

2.2.1.2 Only stressed vowels may be nasalized

The Chatino languages are famous within Zapotecan languages for their nasalized vowels (Gay, 1881), and Tataltepec Chatino features a contrast in vowel nasality. Only stressed vowels may be nasalized, unless the unstressed vowel is followed by a stressed nasalized vowel across a single laryngeal consonant (§ 3.2.2).[2] Other than the absence of unstressed phonemically nasalized vowels in the lexicon (*CṼCV), evidence for this restriction comes from compound verbs. The motion verb *^{0}yaan* /jã:$^{0\text{-}X}$/ (H.B.go(.3)) 'comes' can be attached to the stem *lkaʔan* /lkaʔã^{X}/ 'follow, pursue' to form *^{0}yalkaʔan* /ja+lkaʔã$^{0\text{-}X}$/ (H.B.go+follow(.3)) 'follows (moving toward the deictic base)'. In this verb, the [+ nasal] feature of *^{0}yaan* has no σ_S to link to, and the vowel is produced as an oral vowel.

2.2.1.3 Mid vowels are restricted in non-unstressed syllables

Most of the examples of /e o/ in σ_W (i.e. non-stem-final) syllables (Table 2.2) come from loans from Spanish, a language which allows all five vowel qualities ({a e i o u}) in all syllables of the language, and which nearly all speakers of Tataltepec Chatino are bilingual in. For example, Spanish *docena* /dosena/ was borrowed as /sen^{j}a$^{0\text{-}L}$/ and *cazuela* /kaswela/ as /sol^{j}a$^{0\text{-}L}$/, which would have the forms */san^{j}ya$^{0\text{-}L}$/ and */sal^{j}a$^{0\text{-}L}$/ if they observed the same phonological changes as native terms.[3] Other examples are cases where

[2] I am unaware of a non-Chatino language where phonemically nasalized vowels are only found in stressed syllables, though I have not done a thorough search for such another example.

[3] The name *^{0}Meyà* likely derives from the hypocoristic form *Meya*, and 'watermelon' is analyzed as '(?)Peruvian squash' rather than using the Spanish term *sandía*, which is the prevaling name for watermelon in the Spanish spoken in Tataltepec and in many Eastern Chatino topolects (e.g. YAI *si^{3}nti^{3}ya^{23}* (Rasch & Suárez Martínez, in press, 393). The watermelon is also known as the 'Peruvian squash' in ZEN (*chojo*

a unstressed /o/ is followed by (or mirrors) a stressed /o/, as in *konòn?* 'worm, caterpillar' and *memè?* 'antlion'. The stressed /o/ can be thought of as licensing the existence of the unstressed /o/ (a process which has also been observed in Itunyoso Triqui (DiCanio, 2008, 48) and Zacatepec Eastern Chatino (Villard, 2015)), or an extension of the translaryngeal vowel harmony rule (§ 4.3.2).

2.2.2 Unstressed syllable syncopation

As soon as researchers began comparing data from disparate Chatino topolects, one of the first things that sprang into relief was the fact that certain languages (such as Zenzontepec Chatino and Zacatepec Eastern Chatino) featured words of more syllables than certain other languages, especially topolects within the Eastern Chatino cluster. This state of affairs has been analyzed as a loss (or devoicing) of a vowel between Proto-Chatino and a modern Chatino topolect (in their case Yaitepec Eastern Chatino) by B. W. Upson and Longacre (1965), and this analysis has been corroborated by other comparative work within Chatino (E. Campbell, 2013a) and by comparison to Proto-Zapotecan (Kaufman, 1993-2007).[4]

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perù) and in Chayuco Coastal Mixtec (*peruu*)(Pensinger, 1974, 123) and San Juan Colorado Coastal Mixtec (*peruu*)(Sara Stark & Lorenzo Cruz, 1986, 136). Though there is no clear indication that watermelons were ever known as (*calabaza*) *peruana* in Spanish, the borrowed status of this term is strongly suspected due to the presence of /p/ and /ɾ/, both rare phonemes in the Chatino and Mixtec languages, as well as the watermelon's status as an introduced species. I hasten to add that much like the peach (Latin *malum persicum* 'Persian apple') and the orange (Dutch *sinaasappel* 'Chinese apple' and Arabic *burtaqaal* 'Portugal'), the watermelon has been named after the region presumed to be its source in other languages, such as Spanish *sandía* (Sindh), Persian *hinduwana* (India), and Mandarin *xīguā* (the West).

[4]Though one topolect, Yolotepec Eastern Chatino, exhibits many etymologically unexpected vowels in unstressed syllables, which may be explained by a period of vowel epenthesis following an earlier stage of vowel loss (Anthony C. Woodbury, p.c. 2013).

Loans	*⁰jwesè*	/hwese$^{0\text{-}L}$ /	'civil authority'	*juez*
	⁰kantyerù	/kantʲeɾu$^{0\text{-}L}$ /	'candleholder'	*candelero*
	⁰kareterà	/kaɾeteɾa$^{0\text{-}L}$ /	'paved road'	*carretera*
	krensya	/kɾensja^{X} /	'belief'	*creencia*
	kwnejonʔ	/kwnehõʔ^{X} /	'rabbit'	*conejo*
	⁰merkù	/meɾku$^{0\text{-}L}$ /	'Wednesday'	*miércoles*
	⁰mesà	/mesa$^{0\text{-}L}$/	'table'	*mesa*
	ᵐeyà	/meja$^{0\text{-}L}$/	'Emilia'	*Emilia, Meya*
	⁰serà	/seɾa$^{0\text{-}L}$ /	'silk'	*seda*
	⁰syenttò	/sjentto$^{0\text{-}L}$/	'hundred'	*ciento*
	tyjo ⁰perù	/tyho^{X} peɾu$^{0\text{-}L}$ /	'watermelon'	*sandía*
	⁰wrelyù	/wɾelʲu$^{0\text{-}L}$ /	'Aurelio'	*Aurelio*
	⁰solyà	/solʲa$^{0\text{-}L}$/	'casserole dish'	*cazuela*
	⁰tronkkòn	/tɾonkkõ$^{0\text{-}L}$ /	'stripped bare'	*tronco*
	⁰senyà	/senʲa$^{0\text{-}L}$/	'dozen'	*docena*
Mirrored	*konoʔ*	/konõʔ^{X} /	'worm, caterpillar'	
	tono	/tonõ^{X}/	'big'	
	tyonòʔ kwatzíʔ	/tʲonõʔ^{L} kʷat͡siʔ^{H} /	'*Verbena officinalis*'	*pitiona*
	memèʔ	/memeʔ^{L} /	'antlion'	
Uncertain	*jenaá*	/hena:^{H}/	'last year'	
	manterà ⁰tyàʔ	/manteɾa^{L} tʲaʔ$^{0\text{-}L}$ /	'woodpecker (sp.)'	
	prenkkan	/pɾenkkã^{X} /	'stiff'	

Table 2.2: Lexemes with unstressed /e o/

This syncopation process (which has analogues throughout the Zapotec languages) has affected each Chatino topolect differently (Table 2.3).[5] Whereas some Eastern Chatino topolects have been nearly completely monosyllabified by this syncopation process (Yaitepec, Quiahije and Teotepec Eastern Chatino (E. Cruz, 2011; McIntosh, 2011; Rasch, 2002)), others have experienced this syncopation only in specific phonological contexts, as is the case with Zenzontepec Chatino, where a non-final vowel is lost only if it is between coro-

[5]pZAPN = Proto-Zapotecan, CZ = Coatec Zapotec, ZEN = Zenzontepec Chatino, TAT = Tataltepec Chatino, ZAC = Zacatepec Eastern Chatino, and SJQ = Quiahije Eastern Chatino.

Gloss	pZAPN	CZ	ZEN	TAT	ZAC	SJQ
'holy'	*tawoʔ	*mbdo*^{7}*	*joʔō*	*joʔò*	*joʔṓ*	*ʔo*$^{M\text{-}(H)}$
'fish'	*kwella	*mbə̂l*	*kwela*	*kwalya*	*kwila*	*kla*
'spider'	*kweyuʔ	*mbê*	*kwiyuʔ*	*n-kwiyuʔ*	*n-kwiyōʔ*	*yuʔ*
'night'	*tye:ʔla	*të*^{7}*l*	*telā*	*^{0}talyà*	*tilà″*	*tla*$^{HL\text{-}(0)}$
'chile'	*ki:ʔnaʔ	*yi*^{7}*n*	*jnyáʔ*	*knyáʔ*	*kinyăʔ*	*kynyaʔ*^{LM}
'fifteen'	*k-tyi:ʔnuʔ	*ti*^{7}*n*	*tíʔnyu*	*tiʔyón*	*tiʔnyǫ̌*	*ʔnyo*^{ML}
'tree'	*yaka	*yà*	*yaka*	*yaka*	*yaka*	*yka*
'people'			*nyatę̄*	*^{0}nyatèn*	*natę̀*	*ntę*$^{HL\text{-}(0)}$
'slept'				*nkw-jáʔ*	*y-ajaʔ*	
'will stay'	*-y-aʔana	*-ya*^{7}*n*	*chanu*	*tyanón*	*kyānǫ́*	*kno*^{H}
'is sweeping'	*-lo:ʔkwa	*-lo*^{7}*b*	*nte-lukwā*	*nk-lyakwă*	*nta-lukwă*	*nt-kwa*^{H}
'eats'	*-aku		*nt-aku*	*nt-aku*	*nky-ako*	*nty-ku*

Table 2.3: Vowel syncope in Chatino and Zapotec

nal consonants and shares its quality with the final vowel of the stem ($V_1 > \emptyset$ / $C_{[+cor]}\_C_{[+cor]}V_2$, where $V_1 \neq V_2$) (E. Campbell, 2014, 158). The syncopation is currently underway in Tataltepec Chatino, in that nearly every prefix vowel (such as the **nku-* prefix of the completive aspect) has been lost, but many unstressed vowels (especially low vowels) of disyllabic stems remain.

The notion of stress is important for Otomanguean linguistics given that unstressed syllables have been candidates for syncopation in many languages of distinct branches of Otomanguean. The stem-final stress of Tataltepec Chatino (which is shared with all modern Chatino languages) is not found among the Zapotec languages, which have stem-initial stress, and thus never syncopate the initial syllable of a stem. The consequences of this stress can be clearly seen when comparing the forms of Coatec Southern Zapotec, a fairly syncopated Zapotec language with stem-initial stress, in Table 2.3 to the Chatino forms.

2.3 Vowel nasality

Vowel nasality is a feature of stems in Tataltepec Chatino in that the value of the [nasal] feature of the stressed syllable of a stem can be replaced by the [+ nasal] value associated with certain inflectional morphemes in a manner parallel to the tone sequence replacement discussed in § 2.5, § 8.2, and § 9.1.2. [6] Unlike the suprasegmental nasality feature of languages like the Eastern Tukanoan languages where the nasality feature is applied to the entire stem, both vowels and some consonants (Kaye, 1971), vowel nasality appears only on the stressed, (i.e. rightmost) vowel of a stem, and this nasal feature spreads across vowels from right-to-left only if the intervening consonant is /ʔ/ or /h/ (§ 4.3.2). The presence of this [+ nasal] feature is indicated in the phonemic orthography (within slashes //) by a tilde place over a stem's final vowel, and in the practical orthography by a <n> after the final vowel of a stem. Not all nasal vowels are the result of this [+ nasal] feature, however: oral and nasal vowels in stressed syllables are neutralized after nasal segments. Thus, a form like [nanãʔ] 'mud' could either be represented as /nanaʔ^{X}/ where the final vowel surfaces as [ã] after [n] or as /nanãʔ^{X}/ where the final vowel is associated with a [+ nasal] feature.

(1) shows the spreading of a [+ nasal] feature across the laryngeal consonants of *ntaʔan* /ntaʔã^{X}/ 'roasting ear' and *tykijin* /tʲkihĩ^{X}/ 'itch' to bring about the nasalization of the preceding vowel, whereas the [+ nasal] feature associated with the final vowel of *xlyatén* /ʃlʲatẽ^{H}/ 'nest' only nasalizes the rightmost, stressed vowel and does not spread across the

[6] Vowel nasalization may have possibly been an suprasegmental feature of root morpheme for some time. E. Campbell (in press) notes that pZAPN *(l)l > pCH *n in stems containing nasalized vowels. Such a non-local assimilation could be explained through *(l)l's underspecification for [± nasal].

non-laryngeal consonant, leaving the /a/ of the penultimate syllable oral.

(1) Nasality spreads across laryngeal consonants

a.	*ntaʔan*	/ntaʔãˣ/	[ⁿdᵃ̃ʔɑ̃]	'roasting ear'
b.	*tykijin*	/tʲkihĩˣ/	[tʃkʲ̃hĩ]	'itch'
c.	*xlyatén*	/ʃlʲatẽᴴ/	[ʃlʲạtɛ̃]	'nest'

In syllables associated with the [+ nasal] feature there is a neutralization of the vowels /o u/. In this context, only one vowel quality /õ/ is observed. Thus, a form like [kõː] 'edible tuber' may either be represented as /koː/ or /kuː/ associated with the [+ nasal] feature.

In portmanteau compounds (in which the first stem has been incorporated into the second), the loss of stress of the first stem's final vowel brings about a loss of any [+ nasal] feature that may have been associated with stem. This can be seen in the contrast between the compound verb *⁰yaan kiʔyà* /jãː⁰⁻ˣ+kiʔjaᴸ/ (H.B.go+bring(.3)) and the more fused portmanteau verb *⁰yakiʔyà* /jakiʔja⁰⁻ᴸ/ (H.B.bring(.3)) 'brings (it) (home)', as seen in (2).

(2) Vowels in unstressed syllables cannot be long or nasal

a.	*⁰yaan kiʔyà*	/jãː⁰ kiʔjaᴸ/	[ˈjɑ̃ːkiʔˈja]	'H.B.bring'
b.	*⁰yakiʔyà*	/jakiʔja⁰⁻ᴸ/	[jạkiʔˈja]	'H.B.bring'

2.4 Vowel length

Tataltepec Chatino has a contrast between short and long vowels. Long vowels can only occur in stem-final σ_S, whereas short vowels can occur in stressed and unstressed (σ_W) syllables. The length feature is associated with a stem, and is realized on the stressed, rightmost vowel of the stem. Since many long vowels in the Chatino languages are the re-

sult of a lengthening of monomoraic Proto-Chatino words, most stems associated with the length feature contain only one syllable like *taàn* /tã:^{L}/ 'fat', though some words with long vowels (mostly old, fused compounds) do contain more than one syllable, as with *tyakaàn* /tʲakã:^{L}/ 'forehead'.

Unlike other vowel nasality and tone, there are no morphological alternations which involve the lengthening or shortening of a vowel. Nevertheless, length is included as a suprasegmental property owing to its prosodic nature and its distribution (only occurring in stressed vowels).

In portmanteau compounds (in which the first stem has been incorporated into the second), the loss of stress of the first stem's final vowel brings about a loss of any length feature that may have been associated with the stem. This can be seen in the contrast between the compound verb ^{0}*yaan kiʔyà* /jã:$^{0\text{-}X}$+kiʔja^{L}/ (H.B.go+bring(.3)) where both ^{0}*yaan* and the final syllable of *kiʔyà* are stressed and the more fused portmanteau verb ^{0}*yakiʔyà* /jakiʔja$^{0\text{-}L}$/ (H.B.bring(.3)) 'brings (it) (home)', where only the final syllable is stressed. as was seen in (2) above.

Unlike with tone and nasality, length does not spread to unstressed syllables. Length is also not present in syllables of the form /V.ʔV/, that is, there are no *VʔV:, *V:ʔV, or *V:ʔV: sequences in Tataltepec Chatino. This absence of a vowel length contrast in vowels separated only by /ʔ/ is also noted for other Chatino topolects with a vowel length contrast, such as Zacatepec Eastern Chatino and Zenzontepec Chatino.[7] While this could be

[7]Zenzontepec Chatino does have some phonetic [VʔV:] sequences in cases where an onsetless clitic has been affixed to a /VʔV/ stem, as with [tʲãʔã:] 'our relative' from /tʲáʔã=ã/ (`relative=1IN') (E. Campbell, 2014, 95), but within roots and stems, long vowels are not present in VʔV canons.

seen as an argument in favor of a suprasegmental analysis of (at least intervocalic) glottal stop, I argue in § 3.3.2.4 that these glottal stops are better analyzed as consonants.

2.5 Tone

Lexical tone in Tataltepec Chatino is stem-aligned in that one and only one tone sequence is associated with any given stem. Each tone sequence is composed of zero to two of Tataltepec Chatino's four tones: a low L, a high H, the contour tone $\widehat{HL}$, and the superhigh 0. Tones are associated to the moras of a word from right to left in order to be realized. If a monomoraic stem is associated with two tones (as is the case with the [0L] sequence), then both tones are associated with the mora, and a complex tone is formed. Long vowels, which are associated with two moras, can be associated with two tones. All tones are either linked or unlinked. Linked tones are assigned to a mora and will surface in all phonological environments, whereas unlinked tones are not underlying associated with a mora and will only be assigned to a mora and be realized in particular phonological contexts. If an unlinked tone is not assigned to a mora, it is simply unrealized and has no effect on the realization of the utterance it is a part of.

When two tones are attached to a stem, they associate to moras of the stem from right-to-left on a one-to-one basis. Figure 2.1 shows that when the superhigh unlinked tone of tone sequence /0-L/ is not linked to the word *k-^{0}akòn* /k-akõ$^{0\text{-}L}$/ 'I will eat' (P-eat.1SG), as on the left, only the L tone will be linked to the rightmost mora. When the superhigh tone is linked (as occurs in particular phonological contexts §5.2.2), the tones are again associated to the moras of the stem from right to left. The L tone occurs on the rightmost mora, realized as a low tonal target, and the superhigh tone is attached to the penultimate mora

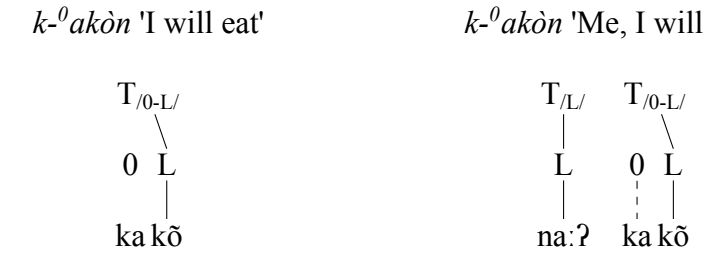


Figure 2.1: Tones are linked to moras from right to left

Figure 2.2: Two tones can be linked to one mora in a monomoraic stem

and syllable, which is realized with a swiftly rising F0 gesture.

An example of two tones linking to one mora can be seen in Figure 2.2 where the word *⁰skà* /ska$^{0\text{-}L}$/ 'sugar' appears in many contexts with only a low tone since the superhigh tone associated with it is unlinked and does not attach. In those phonological contexts where the superhigh tone is linked to the stem, the result is a [0L] tone sequence which features a sharp fall from a superhigh level to a low pitch level.

Chapter 5 will explore the tonal phonology of Tataltepec Chatino in detail.

Chapter 3

Segmental Phonology

This chapter will explore the segmental inventory of Tataltepec Chatino and describe the distribution of each phoneme as well as the allophonic alternations which can be identified. § 3.1 will provide a brief sketch of the major contrasts active in the language and the phonemes involved, and § 3.2 will discuss some of the phonological processes active in the language. The next sections will discuss the consonants (§ 3.3) and the vowels (§3.4) of Tataltepec Chatino in turn.

3.1 Phonology overview

As laid out in Table 3.1, Tataltepec Chatino has twenty-two consonant segments, twenty of which are widely present in native vocabulary and two of which are limited to nativized loans. There are two laryngeal consonants, /ʔ/ and /h/, which differ from most other consonants in that they are transparent to vowel harmony rules that are blocked by any other consonants.[1] There are three velar consonants, a plain velar stop /k/, a labialized velar stop /k^{w}/, and a labiovelar glide /w/. There are two series of coronals, a plain series /t t͡s s n l/ and a laminal series /t^{j} t͡ʃ ʃ n^{j} l^{j}/. The laminal series is historically derived from the

[1] /ʔ/ is presumed to be a consonant here, and a discussion motivating its consonantal nature in Tataltepec Chatino will is found in § 3.3.2.4.

plain series via phonologized allophonic variation conditioned by a preceding front vowel (E. Campbell, 2013a), and some synchronic morphology will cause a stem-initial plain coronal to mutate into its laminal counterpart. Though not part of the same set of alternations as the plain and laminal coronals just mentioned, /ɾ/ is placed with the plain coronals and /j j̥/ with the laminals since they share distinctive features with them. The four labial consonant phonemes {p m f β̞} are less common than the other consonants, and {f β̞} are mostly limited to nativized loans.

Obstruents are voiceless and sonorants are voiced, except for the voiceless /j̥/. Stops surface as voiced stops when they occur between voiced segments in a word--the first segment of which must be a nasal consonant. The non-labial nasals undergo place assimilation with a following consonant when they are in clusters. The oral sonorants appear as voiceless when followed by a voiceless consonant or when preceded by /h/, except for /ɾ/ which does not appear in this context. The affricate /t͡s/ surfaces as the fricative /s/ before obstruents (which are all velar stops in the data) and the stop /tʲ/ surfaces as the affricate /t͡ʃ/ in the same context.

	Coronals		Velars		
Labials	Plain	Laminal	Plain	Labialized	Laryngeal
p	t	tʲ	k	kʷ	ʔ
	t͡s	t͡ʃ			
(f)	s	ʃ			h
m	n	nʲ			
(β̞)		j j̥		w	
	l	lʲ			
	ɾ				

Table 3.1: Consonant phonemes

As will be discussed more fully in § 4.2, consonants can form clusters of up to four consonants, though the first of these must be a nasal. Geminate stops are found for all stops except /p/ and /ʔ/. These geminate stops always occur following a tautosyllabic nasal and are the source of the only surface voiceless stops between a nasal segment and a voiced segment.

Table 3.2 lists Tataltepec Chatino's nine short (/a e i o u ã ẽ ĩ õ/) and nine long vowels (/a: e: i: o: u: ã: ẽ: ĩ: õ:/). Long vowels only occur in stem-final syllables. Only four nasal vowel qualities (/ã(:) ẽ(:) ĩ(:) õ(:)/) are observed. All vowel qualities appear in final syllables, but mid vowels are less common in non-final syllables. Outside of a few lexemes, non-final mid vowels only occur if the following final vowel is a like mid vowel, a pattern also observed in Zacatepec Eastern Chatino, and the Triqui languages also spoken in Oaxaca (DiCanio, 2008; Hollenbach, 1977; Villard, 2015).

i			u	ĩ		
e			o	ẽ		õ
	a				ã	
i:			u:	ĩ:		
e:			o:	ẽ:		õ:
	a:				ã:	

Table 3.2: Vowel phonemes

The Tataltepec Chatino word is comprised of one or more stems plus any prefixes. Historically, these stems (at the Proto-Chatino stage) were dimoraic and consisted of disyllabic (N)CV(ʔ).CV(ʔ) or monosyllabic (N)CV:(ʔ) shapes and prefixes were usually of the form (N)CV-. Thus, at an earlier stage of the language, most verbs were trisyllabic. At some point after the Proto-Chatino stage (and probably after the split of Pre-Tataltepec

from Proto-Coastal Chatino), processes of vowel syncopation, cluster simplification, and syllable deletion took root and continue acting on the lexicon to this day.[2] Currently, most non-complex words in Tataltepec Chatino contain at most two syllables. Each stem is associated with one lexical tone class (which contains a sequence of zero to two tones) and contains one stressed syllable. Person clitics can have their own tone class, but form a phonological constituent with their host in that they do not receive sentence-level stress.

Stressed syllables are the stem-final syllables where the number of phonemic contrasts is greatest. By contrast, unstressed syllables are the penultimate and antepenultimate (or earlier) syllables where the range of possible phonemic contrasts is reduced. Vowel nasality and length contrasts are absent in these unstressed syllables, and there may be some restrictions on vowel quality since mid vowels appear much less often in unstressed syllables. Stress, especially as it relates to the distribution of autosegmental features, is discussed at greater length in § 2.2.

Tataltepec Chatino has a complex system of tone (Ch. 5) in which one of eight tone sequences (each comprising up to two tones) is linked to each stem. The tones are linked to the moras of the word on a right-to-left basis, with the rightmost tone of a sequence being associated with the stressed and final mora, and then the next tone of the sequence (if any) is linked to the penultimate mora if there is one, or to the final mora if the word is monomoraic. The tones found in Tataltepec Chatino's tone sequences are L(ow), H(igh), $\widehat{\text{HL}}$ (a mid-level falling tone) and 0 (a superhigh rising tone). The label of "falling" for the

[2] As will be discussed below in Chapter 6, an appreciable amount of change can be observed in the forty-some-odd year gap between the collection of data for (K. Pride & Pride, 1970) and my own visits to Tataltepec from 2009-2012.

/H͡L/ tone is somewhat inadequate as it represents a shallow tone movement rather than a fall from high to low. The superhigh tone 0 can either be linked or unlinked in a tone sequence. If linked, it will surface in all contexts, whereas an unlinked superhigh tone will only appear in particular phonological contexts (namely, after a H or L tone).

Tone will be indicated throughout this work in practical orthography (set off by italics) by diacritics over vowel symbols and the presence or absence of a superscript <^{0}> before the word, and in the phonemic notation by a superscript sequence of letters indicating the tone class {X L H 0-X 0-L H͡L 0 0L}. <0-> indicates an unlinked superhigh tone, and <X> indicates the absence of a linked tone. Tone will not be indicated in phonetic notation unless it is relevant to the immediate discussion, in which case tone letters will be used in which ˥ indicates a tone produced in the highest portion of a speaker's range, ˩ the lowest, and an angle line such as ˧˥ indicates a contour tone moving from one tone level to another (here low-mid to high).

3.2 Segmental phonological processes

This section will summarize some of the segmental phonological processes which have been identified and introduced throughout the discussions of vowel and consonant phonemes in the preceding sections. These include the assimilation of tautosyllabic nasals to the place of articulation of a following obstruent, nasal spreading across a laryngeal consonant, and the phenomena relating to the question of the status of partially nasalized stops in Tataltepec Chatino as either complex phonemes or clusters.

3.2.1 Nasal place assimilation

The nasal segment /n/ assimilates to the place of the following obstruent. Only the bilabial nasal /m/ can precede a non-homorganic obstruent (specifically with the fricatives {s ʃ}), and there is no evidence that /nʲ/ occurs in the contexts that create these nasal-obstruent clusters. Table 3.3 shows all possible sequences of a non-labial nasal and an obstruent in the language. Note that in each case, the nasal assimilates to the place of articulation of the following obstruent, and also that the obstruent (if it is a stop followed by a voiced segment) is realized as a voiced stop in this sonorous context. There are no examples of nasals occurring before the rare fricative /f/ and the laryngeals /ʔ h/.

/np/ or /mp/	*mpaà*	/npa:^{L}/	[^{m}ba:]	'co-father'
/nf/			not found	
/nt/	*ntaa*	/nta:^{X}/	[^{n}da:]	'roadrunner'
/n͡ts/	*ntzeèn?*	/n͡tsɛ̃:ʔ^{L}/	[^{n}tsɛ̃:ʔ]	'Pacific sleeper'
/nt^{j}/	*ntyu?wé*	/nt^{j}uʔwe^{H}/	[^{n}d^{j}uʔwe]	'piece'
/n͡tʃ/	*nchuʔ*	/n͡tʃuʔ^{X}/	[^{n}tʃuʔ]	'pineapple'
/nʃ/	*^{0}nxiʔyà*	/n-ʃiʔja$^{0\text{-}L}$/	[^{n}ʃiʔja]	'$_{H}$-scream'
/nk/	*nkòʔ*	/nkoʔ^{L}/	[^{ŋ}goʔ]	'heron'
/nk^{w}/	*nkwayó*	/nk^{w}ajo^{H}/	[^{ŋ}g^{w}ajo]	'tarantula'
/nʔ/			not found	
/nh/			not found	

Table 3.3: Nasal-obstruent sequences

The rule in (1) describes this process. The rule is specified as applying only to /n/ and The labial nasal /m/ does not participate in this place assimilation, and there is no evidence to suggest that /nʲ/ occurs in contexts where assimilation could have occurred.

(1) Nasal Place Assimilation

$/n/ \rightarrow [\alpha \text{ place}] \quad /\_\_C_{[\alpha \text{ place}]}$

3.2.2 Translaryngeal vowel harmony

Two vowels separated only by a laryngeal consonant will agree in nasality and quality. With only few exceptions, most of which involve recent loans (§ 4.3.2) this holds for all roots of the language. This process is described in the rule in (2).

(2) Translaryngeal vowel harmony

$V_1 \rightarrow V_2 \quad /\_\_\{h,ʔ\}V_2$

3.2.3 Stop voicing

A non-laryngeal stop between a nasal consonant and a voiced segment (be it a vowel or a voiced sonorant) will assimilate to the voiced environment and be pronounced as a voiced, rather than a voiceless, stop. The rule in (3) describes this process, which applies only to stops and not to affricates. Voicing assimilation notably does not occur between vowels. Surface voiceless stops between nasal segments and vowels are not exceptions to this rule, but actually reflect an underlying geminate stop (§ 3.3.2.2), which is resistant to this voicing assimilation due to the greater closure duration of the stop.

(3) Post-Nasal Voicing Assimilation

$C_{\left[\begin{smallmatrix}\text{-son}\\ \text{-cont}\end{smallmatrix}\right]} \rightarrow C_{[\alpha \text{ voi}]} \quad /N\_\_[\alpha \text{ voi}]$

3.2.4 Sonorant devoicing

While voiceless stops assimilate to a voiced environment to become voiced stops, the oral sonorants of Tataltepec Chatino assimilate to voiceless environments and become voiceless. In some cases, these voiceless sonorants are produced as voiceless fricatives.

The oral sonorants appears as voiceless if they either occur at the beginning of a word before a voiceless segment, as summarized by the rule in (4), or if they follow /h/ (5).

(4) Word-initial Sonorant Devoicing

$$C_{\left[\begin{smallmatrix}+son\\-nas\end{smallmatrix}\right]} \rightarrow C_{\left[\begin{smallmatrix}-son\\-voi\end{smallmatrix}\right]} \quad /\#\_\_C_{[-son]}$$

(5) Post /h/ devoicing

$$C_{[+son]} \rightarrow C_{[-voi]} \quad / h\_\_$$
$$/h/ \rightarrow \emptyset \quad /\_\_C_{\left[\begin{smallmatrix}+son\\-voi\end{smallmatrix}\right]} \quad \text{(optional)}$$

These rules affect all oral sonorants except for /ɾ/ which is not found as the first consonant of a word-initial cluster (though it is found in /hɾ/ clusters). Since /ɾ/ is a marginal phoneme in Tataltepec Chatino's native vocabulary, this gap likely reflects historical accident rather than a restriction.

After /h/, the sonorants {n nʲ w j l lʲ} are devoiced {n̥ n̥ʲ w̥ j̥ l̥ l̥ʲ}, but unlike the in the word-initial environment, the laterals are not produced as fricatives. The resulting /hC$_{[-voi]}$/ sequence output by this rule can coalesce as /C$_{[-voi]}$/, as described by the optional rule in (5).

Evidence that these sonorants form clusters with a preceding /h/ (except when the /h/ is optionally deleted), and do not simply represent voiceless sonorants comes from the

separability of the /h/ from the sonorant in contractions such as *jnaàʔ* /hna:ʔ^{L}/ 'NSUBJ.1SG' (< *jiʔìn naàʔ* /hiʔĩ^{L} na:ʔ^{L}/ 'NSUBJ 1SG').

3.2.5 Deaffrication of /ts/

The affricate /t͡s/ does not appear before the velar stops {k k^{w}}, where [s] appears instead. This is analyzed as a process of deaffrication in which the affricate becomes [+cont] and is realized as /s/, as described in (6). $C_{[-son]}$ is used to identify {k k^{w}} since the only other consonants which appear after /t͡s/ are sonorants.

(6) Deaffrication

/t͡s/ → [+cont] /__$C_{[-son]}$

Before the velar stops /k k^{w}/ there is a neutralization of the affricate /t͡s/ and the fricative /s/. Evidence for this neutralization can be found in the presence of the affricate in words like *tzaká* /t͡saka^{H}/ 'one', and the fricative in shorter forms deriving from them, as with *ska* /ska^{X}/ 'INDEF/one'. This neutralization is also seen in ^{0}*skiʔyà* /skiʔja$^{0\text{-}L}$/, a contracted form of ^{0}*tzakiʔyà* 'will bring (it)' (a compound formed of ^{0}*tzaa* 'P.NB.go' and ^{0}*kiʔyà* 'P.TR.carry'). Unlike other processes of deaffrication in the literature (e.g. Basque (Hualde, 1988), Yucatec Maya (Straight, 1976, 58) and Nishga (Shaw, 1987)), this deaffrication uniquely affects /t͡s/---and not /t͡ʃ/, the other affricate in the language---and stops are not affected in the same environment.

3.2.6 Affrication of /tʲ/

The laminal stop /tʲ/ does not appear before the velar stops {k k^w}, where [tʃ] appears instead. This is analyzed as a process of affrication in which the stop becomes [+delayed release] and is realized as [tʃ], as described in (7). $C_{\left[\begin{smallmatrix}\text{-son}\\ \text{-cor}\end{smallmatrix}\right]}$ is used to identify {k k^w} since the other consonants that follow /tʲ/ are either non-coronal sonorants (which do not affect the laminal stop), or are coronals that either form a geminate (if a stop) or cause the coronal to velar dissimilation (if a nasal or a lateral).

(7) Affrication

/tʲ/ → [+del. rel.] /__$C_{\left[\begin{smallmatrix}\text{-son}\\ \text{-cor}\end{smallmatrix}\right]}$

3.2.7 Develarization of /w/

As mentioned in § 3.3.6.4, the labiovelar glide /w/ is realized as a bilabial approximant [β̞] before a high front vowel {i(:) ĩ(:)}. This is captured by the rule in (8), where /w/ becomes [-high] and is realized as [β̞] before a high front vowel ($V_{\left[\begin{smallmatrix}\text{+high}\\ \text{+front}\end{smallmatrix}\right]}$).

(8) Develarization

/w/ → [-high] /__$V_{\left[\begin{smallmatrix}\text{+high}\\ \text{+front}\end{smallmatrix}\right]}$

3.3 Consonants

Having been made aware of some of the processes which affect the segments of Tataltepec Chatino, we will now explore each of the consonants. Tataltepec Chatino has a consonant phoneme inventory similar to that of other Chatino languages, with voiceless ob-

struents and (mostly) voiced sonorants at six points of articulation (labial, dental, palatal, velar, labiovelar, and laryngeal), and an opposition between two coronal series which have been variously characterized as "plain" or "apico-dental" and "laminal", "palatalized", or "palato-alveolar".

Only a few consonant phonemes identified here for Tataltepec Chatino are not identified as phonemes in other topolects. The voiceless glide [j̥], which is considered a phoneme here, is analyzed as an /hj/ cluster or can be explained as an allophone of /j/ in other Chatino topolects such as Quiahije Eastern Chatino (E. Cruz, 2011, 77,81). A /β̞/ approximant phoneme distinct from /w/ is also reported for Zenzontepec Chatino, but is has not been identified in descriptions of Eastern Chatino to date. A marginal /f/ labiodental fricative phoneme has been reported in no other Chatino language. Some consonant phonemes of Chatino topolects that are not found in Tataltepec Chatino are the glottalized sonorants /ˀj ˀw ˀn/, non-voicing stops, and interdental fricative of Yaitepec Eastern Chatino (Rasch, 2002), and the voiced stops posited for syncopated topolects such as Quiahije Eastern Chatino and Teotepec Eastern Chatino (E. Cruz, 2011; McIntosh, 2011).

This section will describe the consonants of Tataltepec Chatino, first by providing a general overview of the consonants and a more specific discussion of consonants by their manner of articulation. Next, the consonants are presented individually according to place of articulation.

3.3.1 Consonants overview

Table 3.4 lists the distinctive features of the consonants of Tataltepec Chatino using the features defined by Halle and Clements (1983). The [high] feature is particularly ac-

tive in this language as the distinguishing feature between the plain and palatal series of coronals. The [voice] feature is largely redundant with the [sonorant] feature, and is only used to distinguish the voiceless palatal glide /j̥/, likewise the [+ delayed release] feature is also almost entirely redundant with [+ continuant], being used only to distinguish the affricates /t͡s t͡ʃ/ from their corresponding stops /t tʲ/.

	labial	nasal	coronal	cont.	son.	voiced	lat.	high	del. rel.
p	+	-	-	-	-	-	-	-	-
t	-	-	+	-	-	-	-	-	-
tʲ	-	-	+	-	-	-	-	+	-
k	-	-	-	-	-	-	-	+	-
kʷ	+	-	-	-	-	-	-	+	-
ʔ	-	-	-	-	-	-	-	-	-
f	+	-	-	+	-	-	-	-	+
s	-	-	+	+	-	-	-	-	+
ʃ	-	-	+	+	-	-	-	+	+
h	-	-	-	+	-	-	-	-	+
t͡s	-	-	+	-	-	-	-	-	+
t͡ʃ	-	-	+	-	-	-	-	+	+
m	-	+	-	-	+	+	-	-	-
n	-	+	+	-	+	+	-	-	-
nʲ	-	+	+	-	+	+	-	+	-
β̞	+	-	-	+	+	+	-	-	+
j	-	-	-	+	+	+	-	+	+
j̥	-	-	-	+	+	-	-	+	+
w	+	-	-	+	+	+	-	+	+
l	-	-	+	+	+	+	+	-	+
lʲ	-	-	+	+	+	+	+	+	+
ɾ	-	-	+	-	+	+	-	-	-

Table 3.4: Distinctive features of consonants

The rest of this section will introduce the reader to each of the consonant phonemes of Tataltepec Chatino grouped according to their manner of articulation. Within each man-

ner of articulation, any relevant phonological processes are described and then the phonemes are presented in order from the laryngeal to the labial points of articulation.

3.3.2 Stops

Tataltepec Chatino has six stops {p t tʲ k kʷ ʔ} across four places of articulation (labial, coronal, velar, and laryngeal) with two additional secondary articulations possible for the stops at the coronal (laminal) and velar (labialized) points of articulation.

The glottal stop has a quite different distribution than the other stops. It does not occur in tautosyllabic consonant clusters, and is only one of two possible coda consonants (and the only possible native coda). It is also limited to occurring only once in roots, unlike most other consonants which do not have the same restriction.

3.3.2.1 Post-nasal voicing assimilation

The stops (excluding the glottal stop and the affricates) are normally produced as voiceless stops with short-lag voice onset times, but when preceded by a nasal segment and followed by a voiced segment, the stops are produced as voiced stops with negative or small positive voice onset times. There are no instances of /Nʔ/ sequences in Tataltepec Chatino, and /t͡s t͡ʃ/ in similar contexts are not produced as voiced affricates.[3]

[3] In Zenzontepec Chatino, affricates also undergo post-nasal voicing, as in *nchīʔyú* [nʲdʒiʔju] 'fruit' (E. Campbell, 2014, 61).

3.3.2.2 Gemination

Even though a stop preceded by a nasal is (per the rule in (3)) to become voiced if followed by a voiced segment, a number of voiceless stops are still found between nasal segments and vowels. These voiceless stops are underlyingly geminates, which are resistant to the voicing assimilation by virtue of their greater closure duration.

When two like consonants occur adjacent to one another, they share any secondary articulations (laminal or labialized) they may have, and if preceded by a nasal segment will not undergo allophonic voicing. (9) shows that if at least one coronal stop in a coronal-coronal stop pair is laminal, then the resulting geminate stop will be laminal as well. Likewise, if one of the dorsal stops in a dorsal-dorsal stop pair is labialized, then the resulting geminate will be labialized--provided of course that the following vowel is not also labial.

(9) Gemination

p	p		---
t	t	→	tt
t	t^j	→	t^jt^j
t^j	t	→	t^jt^j
t^j	t^j	→	t^jt^j
k	k	→	kk
k	k^w	→	k^wk^w
k^w	k	→	k^wk^w
k^w	k^w	→	k^wk^w

3.3.2.3 Prenasalized stops are sequences

Tataltepec Chatino's word frequently contain voiced oral stops which are preceded by a short period of nasalization. To highlight the short duration of the nasal gestures of these nasal-stop sequences, they are transcribed with superscripted symbols in pho-

netic transcriptions (e.g. /nta:^{X}/ [^{n}da:] 'bean'). While examples of underlying prenasalized stops do exist in the world's languages (e.g. Fijian (Geraghty, 1983; Schütz, 1985)), the question of whether a nasal-stop sequence is a cluster or a single prenasalized stop segment is a phonological question rather than a phonetic one, and given that earlier analyses of prenasalized stops for languages such as Sinhala (Feinstein, 1979) and various Bantu languages including Luganda and Runyambo have been probed and rejected in favor of (N+C) cluster analyses (Herbert, 1975; Hubbard, 1995; Maddieson & Ladefoged, 1993), it is a good idea to base the decision of whether [^{N}C] represents a singleton segment or a cluster on language-internal data, rather than an impressionistic judgment of the duration of nasal gestures.

Though cluster-initial nasals might be said to form single segments with a following obstruent since the largest onset clusters in the language are those whose first member is a nasal (NCCC). While an analysis of [NC] as a single complex segment (/^{N}C/) would simplify the phonotactics of the language, in that only CCC clusters would be possible, this analysis is sub-optimal. Words beginning with nasal-initial clusters are morphologically complex, being comprised of a root or stem that has received a nasal prefix. Among verbs, this nasal prefix is part of the exponent of the completive, habitual, and progresive aspects (or the prefix is solely *n*-) and attaches indiscriminately to consonant- and vowel-initial stems; among nouns, the nasal prefix is a historic nasal accretion that has fused to the stems it once attached itself to, and may be the residue of a definite/specific article *na (E. Campbell, 2013a, 410). This morphological separability is the clearest language-internal evidence for a sequence rather than a complex segment analysis of nasal-initial clusters, in addition to the fact that Tataltepec Chatino independently and uncontrover-

sially has nasal segments, oral stops, and consonant clusters.

When NC(C) clusters appear word-internally (as in loans and some fossilized compounds) the nasal portion of the NC(C) cluster is realized as a full nasal segment, and not as a minimized nasal gesture. (10) lists some examples of words with NC clusters and their various realizations. When these are word-initial, a /mC/ cluster is realized as [^{m}C] and /nC/ is realized as [^{n}C], [^{ɲ}C], or [^{ŋ}C] depending on the place of articulation of C.

(10) Examples of NC clusters

a.	*^{0}mplinyì*	/mplin^{j}i$^{0\text{-}L}$/	[^{m}blin^{j}ĩ]	'melon'
b.	*mskùʔ*	/mskuʔ^{L}/	[^{m}skuʔ]	'grasshopper'
c.	*^{0}mxà*	/mʃa$^{0\text{-}L}$/	[^{m}ʃa]	'mass'
d.	*^{0}kamxà*	/ka^{X}+mʃa$^{0\text{-}L}$/	[kamʃa]	'shirt'
e.	*ntaa*	/nta:^{X}/	[^{n}da:]	'roadrunner'
f.	*nttìʔ*	/ntiʔ^{L}/	[^{n}tiʔ]	'want, like'
g.	*ntykwiʔ*	/nt^{j}k^{w}iʔ^{X}/	[^{ɲ}tʃk^{w}iʔ]	'charcoal'
h.	*ntzeènʔ*	/n$\widehat{ts}$ɛ̃:ʔ^{L}/	[^{n}tsɛ̃:ʔ]	'Pacific sleeper'
i.	*ntyuʔwé*	/nt^{j}uʔwe^{H}/	[^{ɲ}d^{j}uʔwe]	'piece'
j.	*nkinyaʔ*	/nkin^{j}aʔ^{X}/	[^{ŋ}gin^{j}ɑ̃ʔ]	'wax'
k.	*^{0}nkkon*	/nkkõ$^{0\text{-}X}$/	[^{ŋ}kõ]	'turtle'
l.	*nkwata*	/nk^{w}ata^{X}/	[^{ŋ}g^{w}a̤ta]	'pinecone'

An alternative hypothesis would be that the initial nasal segments are not tautosyllabic with the rest of the cluster and its following vowel, and are themselves syllabic, serving as the nucleus of their own syllable, and therefore not forming an overly-large consonant cluster. However, the word-initial nasals are not syllabic, *contra* K. Pride and Pride (1970, vi). Though word-initial nasals in Nasal-Obstruent clusters do exhibit an intensity peak, they share none of the other properties of syllables, most importantly, nasal segments do not carry tonal contrasts in Tataltepec Chatino or any other extant Chatino

language.[4] This also appears to be true of the Zapotecan languages as a whole, where the only language I am aware of in which any nasals can bear tone is Coatec Southern Zapotec. In this language, the tone-bearing sonorant enclitic pronouns (=*n̂* '1SG', =*ńh* (/=ŋ́/) '1IN', =*l̂* '2.FAM', and =*ḿ* '3.HUM.RESP') are always realized in coda position. These tone-bearing sonorants are never part of complex onsets, which never bear tone (Beam de Azcona, 2004, 118).

Thus, NC sequences are taken to be just that, sequences of segments (/NC/) rather than complex segments (/^{N}C/). The reduced size of the phonological inventory and small increase in phonotactic complexity is taken as preferable to the increased number of morphophonological alterations that a complex unitary phoneme analysis would require.

3.3.2.4 The glottal stop /ʔ/

The glottal stop is a frequent consonant in Tataltepec Chatino despite a restriction limiting it to occurring once per stem and simplex word. The glottal stop appears in relatively few contexts in Tataltepec Chatino: it can appear as a word-final (11) or syllable-final coda (12), or it may appear between vowels (13).

(11) Word-final /ʔ/

chúʔ	/tʃuʔ^{H}/	[tʃuʔ]	'coati'
konòʔ	/konoʔ^{L}/	[konõʔ]	'worm, caterpillar'
kiiʔ	/ki:ʔ^{X}/	[ki:ʔ]	'fire'
kwténʔ	/k^{w}tẽʔ^{H}/	[k^{ʷ}tẽʔ]	'spindle'

[4]See E. Campbell (2014, 191-192) for a discussion of this fact with regards to Zenzontepec Chatino.

(12) /ʔ/ in clusters

jaʔwá	/haʔwa^{H}/	[hạʔwa]	'corncrib'
kaʔyà	/kaʔja^{L}/	[kạʔja]	'mountain'
kiʔnyà	/kiʔnʲa^{L}/	[kiʔnʲã]	'bed'
lusuʔpa	/lusuʔ$^{0\text{-}X}$ pa^{X}/	[lusuʔpa]	'magpie'
kuʔma	/kuʔma^{X}/	[kuʔmã]	'2PL'
naʔnì	/naʔni^{L}/	[nạʔnĩ]	'animal'

(13) Intervocalic /ʔ/

joʔò	/hoʔo^{L}/	[h^{o}ʔo]	'holy'
kwleʔé	/k^{w}leʔe^{H}/	[k^{w}l^{e}ʔe]	'half'
^{0}lontaʔa	/lontaʔa$^{0\text{-}X}$/	[lond^{a}ʔa]	'Oaxaca'
teʔèn	/teʔẽ^{L}/	[t^{ẽ}ʔɛ̃]	'jug'

Additionally, [ʔ] can sometimes be heard inserted into the onset slot of onsetless words such as *itya* 'water' (/itʲa^{X}/ → [i.tʲa] ∼ [ʔi.tʲa]).

As in many of the world's languages, the production of the laryngeal gesture in /VʔV/ sequences is quite variable (Pierrehumbert & Talkin, 1992), ranging a short creak in the first half of the vowel [V̰V] to a partial glottal closure between vowels [V^{ʔ}V], to full glottal closure between fully produced vowels [VʔV], as seen in (14).

(14) Possible realizations of /VʔV/

Less constriction	⟷	More constriction		
[V̰V]	∼ [V̰V]	∼ [^{V}ʔV]	∼	[VʔV]

The last of these is only found in hyperarticulated speech; the most common realization in citation contexts is a very short (sometimes quite reduced) vowel followed by a long, complete glottal closure, followed by a full production of the vowel. This short initial vowel is represented in the phonetic transcriptions by a superscript vowel symbol followed by a glottal stop-vowel sequence ([^{V}ʔV]). Even less restricted than instances where

the first vowel is produced with creaky voice [V̰V] are those cases where the first vowel is produced with tense voice [V̤V].

This leads one to consider the possibility that (at least some of) the glottal constriction in Tataltepec Chatino might be explained as a feature of vowels, tone classes, or an independent autosegmental feature of stems. The matter of the phonological status of the glottal stop, and my arguments for treating it as a consonant rather than as a vocalic or autosegmental feature, is taken up in § 4.2.2.

3.3.2.5 Voiceless velar plosive /k/

The velar plosive /k/ in Tataltepec Chatino appears frequently and in many contexts. It appears as the voiceless stop [k] word-initially before vowels (15), intervocalically (16), and in clusters not of the form /Nk[+voi]/ (17).

(15) Word-initial /k/

kaá	/ka:^{H}/	[ka:]	'nine'
kaʔyà	/kaʔja^{L}/	[kạʔja]	'mountain'
kuùʔ	/ku:ʔ^{L}/	[ku:ʔ]	'filthy'
keè	/ke:^{L}/	[ke:]	'flower'

(16) Medial /k/

sakaʔ	/sakaʔ^{X}/	[sạkaʔ]	'cheek'
lakeè	/lake:^{L}/	[lake:]	'tomorrow'
xkukuʔ	/ʃkukuʔ^{X}/	[ʃkukuʔ]	'elbow'

(17) /k/ in clusters

lkaá	/lka:^{H}/	[łka:]	'regrowth field'
kyaʔ	/kjaʔ^{X}/	[kjaʔ]	'foot'
ktyì	/kt^{j}i^{L}/	[kt^{j}i]	'paper'
kxù	/kʃu^{L}/	[kʃu]	'avocado'

The velar plosive appears as [g] when preceded by a nasal segment and followed by a voiced segment such as a vowel (e.g. /nkalʲaʔ$^{0\text{-}X}$/ → [ᵑgaˌlʲaʔ] 'fence') or a voiced consonant (e.g. /nk-loː$^{0\text{-}X}$/ → [ᵑgloː] 'H-remove') as in (18).

(18) /k/ appears as [g] between a nasal segment and a voiced segment

^{0}nkalyaʔ	/nkalʲaʔ$^{0\text{-}X}$/	[ᵑgaˌlʲaʔ]	'fence'
^{0}nkloo	/nk-loː$^{0\text{-}X}$/	[ᵑgloː]	'H-remove'
^{0}nkratù	/nkɾatu$^{0\text{-}L}$/	[ᵑgɾaˌtu]	'hook' < Sp. *garabato*

A rule summarizing the processes affecting /k/ is given in (19).

(19) Rules affecting /k/

/k/	→	[g]	/ N__[+voi]
		[k]	/ elsewhere

Figure 3.1 shows some typical examples of [k] in spectrograms of the phrases *k-^{0}aka yatá k-^{0}aka ktyín* /k-aka$^{0\text{-}X}$ jata^{H} k-aka$^{0\text{-}X}$ ktʲĩ^{H}/ (P-be furrow P-be intake) 'to be a furrow, to be a water intake'.

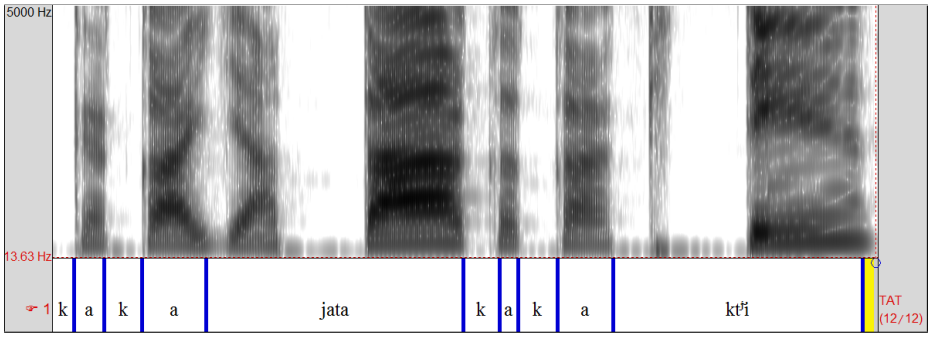


Figure 3.1: Spectrogram of [k] in *^{0}kaka yatá ^{0}kaka ktyín*

Figure 3.2 shows two examples of [g] in the spectrogram of the phrase *nkuʔ naténʔ nkuʔ kchen taan* /nkuʔ^{X} natẽʔ^{H} nkuʔ^{X} kt͡ʃẽ^{X} tãː^{X}/ (people plain people town valley[5]) 'people from the coast [and] people from around Oaxaca city'.

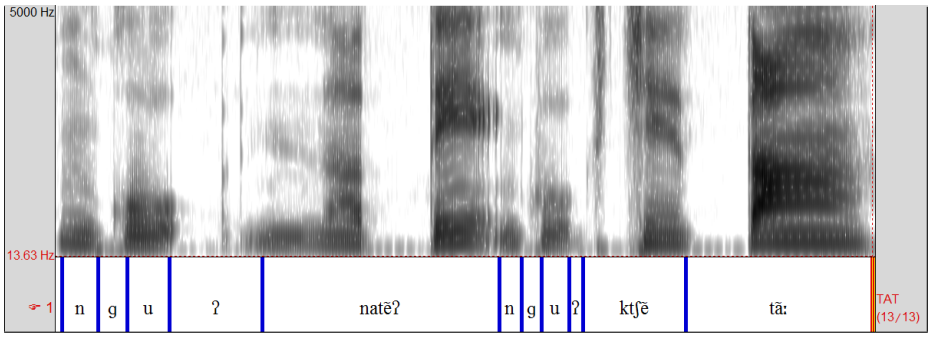


Figure 3.2: Spectrogram of [g] in *nkuʔ naténʔ nkuʔ kchen taan*

There appears to be no restrictions of /k/ co-occurring with vowels as the absence of /kẽ/ and /ek/ sequences are considered to be accidents. There appear to be no restrictions of what consonants may form a cluster with /k/.

3.3.2.6 Voiceless labialized velar plosive /kʷ/

The labialized velar plosive /kʷ/ appears often in Tataltepec Chatino. It appears as the voiceless stop [kʷ] word-initially before vowels (20), intervocalically (21), and in clusters not of the form /Nkʷ[+voi]/ (22).

[5]This word is cognate to the Zapotec ethnonym in many Zapotec languages. In Tataltepec, the term appears to be linked primarily to the Valley of Oaxaca, and associations of what people come from there (which originally would have been Zapotecs, but increasingly are non-indigenous *mestizos*) follow from that association.

(20) Word-initial /kʷ/

⁰kwayù	/kʷaju⁰-ᴸ/	[kʷa̰ju]	'horse' < Sp. *caballo*
kwanyá	/kʷanʲaᴴ/	[kʷa̰nʲã]	'snake'
kwinyaʔ	/kʷinʲaʔˣ/	[kʷinʲãʔ]	'honey'

(21) Medial /kʷ/

⁰nsakwa	/nsakʷa⁰-ˣ/	[ⁿsa̰kʷa]	'mirliton'
⁰jakwà	/hakʷa⁰-ˣ/	[ha̰kʷa]	'belt'
kukwénʔ	/kukʷẽʔᴴ/	[kukʷḛ̃ʔ]	'armadillo'

(22) /kʷ/ in clusters

xkwé	/ʃkʷeᴴ/	[ʃkʷe]	'egg'
kwlyanttĕn	/kʷlʲanttẽ⁰/	[kʷlʲa̰ntḛ̃]	'lark'
nkkwán	/nkʷkʷãᴴ/	[ᵑkʷã̰]	'weasel'

The labialized velar plosive appears as [gʷ] when preceded by a nasal segment and followed by a voiced segment such as a vowel (e.g. /nkʷataˣ/ → [ᵑgʷa̰ta] 'pinecone') or a voiced consonant (e.g. /nkʷlaː⁰-ˣ/ → [ᵑgʷlaː] 'peach') as in (23).

(23) /kʷ/ appears voiced between nasal segments and a voiced segment

nkwata	/nkʷataˣ/	[ᵑgʷa̰ta]	'pinecone'
nkwiyuʔ	/nkʷijuʔˣ/	[ᵑgʷijuʔ]	'spider'
⁰nkwlaa	/nkʷlaː⁰-ˣ/	[ᵑgʷlaː]	'peach'
nkwlalù	/nkʷlaluᴸ/	[ᵑgʷla̰lu]	'tadpole'

When /kʷ/ precedes a voiceless segment, the labialization is heard as voiceless, as in /kʷsẽːᴸ/ → [kʷ̥sẽː] 'evening' in (24). This is to be expected given the regressive voicing assimilation found in clusters in Tataltepec Chatino.

(24) Labial gesture of /kʷ/ is voiceless before voiceless segments

kwseèn	/kʷsẽːᴸ/	[kʷ̥sḛ̃ː]	'evening'
kwtyénʔ	/kʷtʲẽʔᴴ/	[kʷ̥tʲḛ̃ʔ]	'blind'
⁰nkwchen	/nkʷt͡ʃẽ⁰-ˣ/	[ᵑkʷ̥tʃḛ̃]	'quail'
nkwxĭ	/nkʷʃi⁰/	[ᵑkʷ̥ʃi]	'tomato'

A rule summarizing the processes affecting /k^{w}/ is given in (25).

(25) Rules affecting /k^{w}/

/k^{w}/ → [g^{w}] / N_[+voi]
[k$^{w̥}$] / __[-voi]
[k^{w}] / elsewhere

Figure 3.3 shows an example of [k^{w}] in a spectrogram of the phrase *nakwen sti naà?* /nak^{w}ẽ^{X} sti^{X}=na:ʔ^{L}/ (say father=1SG) 'my father said'. The long closure duration of [k^{w}] is typical of medial singleton consonants in this language.

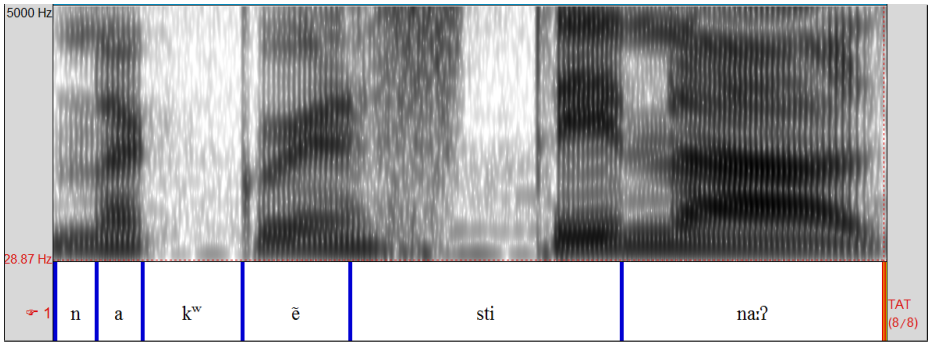


Figure 3.3: Spectrogram of [k^{w}] in *nakwen sti naà?*

Figure 3.4 shows an example of [g^{w}] in a spectrogram of the phrase *nkwinya niʔi jiʔìn* /nk^{w}-in^{j}a^{X} niʔi^{X} hiʔĩ^{L}/ (C-be_built house NSUBJ(.3)) 'their houses were made'.

A voiceless [k$^{w̥}$] can be seen in the spectrogram of *nkwsnyii nkuʔ* /nk^{w}-sn^{j}i:^{X}=nkuʔ^{X}/ (C-grab=3PL) 'they grabbed (it)' in Figure 3.5.

/k^{w}/ cannot occur before a [+ labial] vowel {o u õ} (§ 4.3.5). Though /k^{w}/ only occurs after the vowels {a u}, this is considered to be an accident and not the product of a restriction. /k^{w}/ does not appear to be restricted in what consonants it may form clusters with relative to other stops.

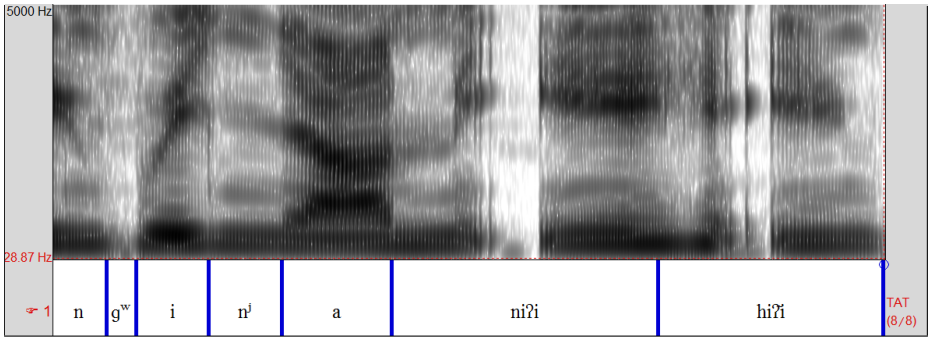


Figure 3.4: Spectrogram of [gʷ] in *nkwinya niʔi jiʔin*

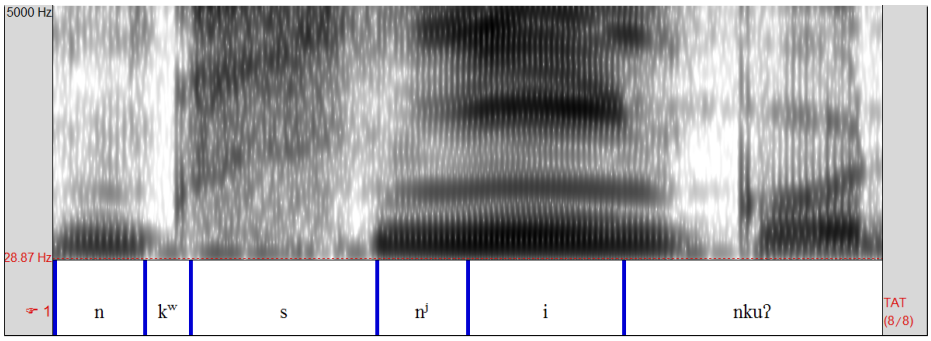


Figure 3.5: Spectrogram of [kʷ] in *nkwsnyii nkuʔ*

The participation of labialized velars in the gemination process, as well as /kʷ/'s distribution in consonant clusters shows that it is a unitary phoneme rather than a sequence. There is, in fact, a marginal contrast between the unitary phoneme /kʷ/ and the sequence /kw/. labialized velars /kʷ/ have been present in the language for some time--most likely since Proto-Zapotecan times--but /kw/ sequences are more recent, having been brought about by the syncopation of an earlier *kVw sequence, most often *kuw. These differ in pronunciation in that the glide portion of a /kw/ sequence is longer than the glide portion of a labialized velar, as has also been reported for Yaitepec Eastern Chatino (Rasch, 2002, 36). This contrast is marginal, since /kw/ sequences are found in short monosyl-

labic words (owing to the syncopation process) and /k^{w}/ occurs in words of all shapes, meaning that the k^{w}:kw contrast is also accompanied by a length contrast. While this contrast is represented in the phonological and phonetic representations of this volume, there is no distinction made between the two in any practical orthography of Tataltepec Chatino.

3.3.2.7 Voiceless dental plosive /t/

The apico-dental plosive /t/ in Tataltepec Chatino appears frequently and in many contexts. It appears as the voiceless stop [t] word-initially before vowels (26), intervocalically (27), and in clusters not of the form /Nt[+voi]/ (28).

(26) Word-initial /t/

teʔèn	/teʔẽ^{L}/	[t$^{ɛ̃}$ʔɛ̃]	'clay jar'
tatyà	/tat^{j}a^{L}/	[tạt^{j}a]	'shrimp, crawfish'
tuʔwa	/tuʔwa^{X}/	[tuʔwa]	'mouth'

(27) Medial /t/

latì	/lati^{L}/	[lạti]	'two days ago'
yatá	/jata^{H}/	[jạta]	'ditch'
^{0}nyatèn	/n^{j}atẽ$^{0\text{-}L}$/	[n^{j}ạtɛ̃]	'person'
^{0}itù	/itu$^{0\text{-}L}$/	[itu]	'Margarito'

(28) /t/ in other clusters

^{0}nkwti	/nk^{w}ti$^{0\text{-}X}$/	[^{ŋ}k^{w}ti]	'trash'
stanʔ	/stãʔ^{X}/	[stãʔ]	'branch'
^{0}twè	/twe$^{0\text{-}L}$/	[twe]	'P.TR.slice'
ntjan	/nthã^{X}/	[^{n}thã]	'bark'

The dental plosive appears as [d] when preceded by a nasal segment and followed by a voiced segment such as a vowel (e.g. /nta:^{X}/ → [^{n}da:]) or a voiced consonant (e.g. /ntwi:^{L}/ → [^{n}dwi:] 'shiny') as in (29).

(29) /t/ appears as [d] after nasal segments and before voiced segments

ntaa	/nta:^{X}/	[^{n}da:]	'bean'
ntuu	/ndu:^{X}/	[^{n}du:]	'liver'
nt-^{0}oʔni	/nt-oʔni$^{0\text{-}X}$/	[^{n}doʔnĩ]	'H-do'
ntwìì	/ntwi:^{L}/	[^{n}dwi:]	'shiny'

The dental plosive appears as the voiceless [t] when preceded by a nasal segment but followed by a voiceless segment or word-initially before a voiced segment as with as with *ntjan* /nthã^{X}/ [^{n}thã] 'bark' and *^{0}twè* /twe$^{0\text{-}L}$/ [twe] 'will slice (it)' in (28) above.

Figure 3.6 shows a typical example of [t] in the phrase *tyaàʔ yatá nakwen* /tʲa:ʔ^{L} jata^{H} nak^{w}ẽ^{X}/ (P.make ditch say(.3)) 'to make a ditch, they said'. The long closure duration of [t] is typical of medial singleton consonants in Tataltepec Chatino. Fig 3.7 shows an example of a voiced [d] in *ka ntà+kwá* /ka^{X} nta^{L}+k^{w}a^{H}/ (toward LOC+DIST) 'towards that place'.

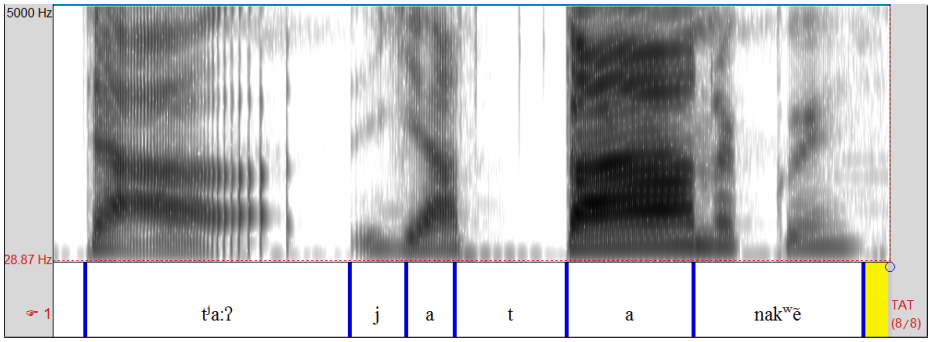


Figure 3.6: Spectrogram of [t] in *yatá*

In native, non-sound symbolic roots, /t/ can precede the consonants /t k k^{w} h j̥ w/ and follow /t k^{w} s ʃ l n w/. In these same roots, /t/ can precede any vowel, and is preceded by /a i u/, though /i u/ are far less common in this context than /a/ is.

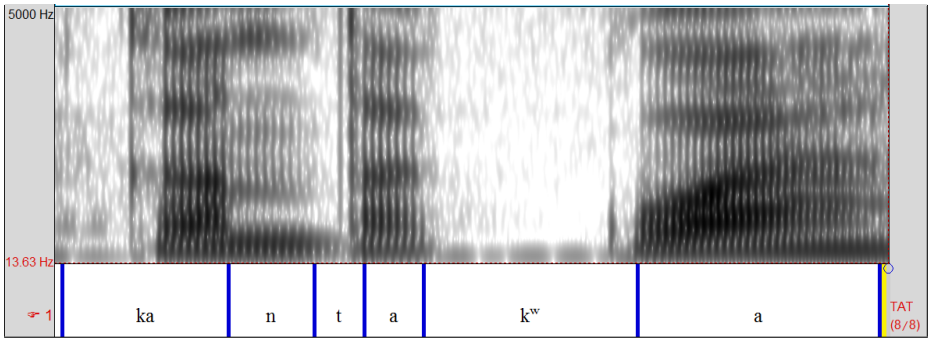


Figure 3.7: Spectrogram of [d] in *ntàkwá*

There are no restrictions on what vowels /t/ may precede or follow. /t/ does not occur before coronal sonorants {n nʲ l lʲ} owing to a dissimilation process affecting these clusters (§ 4.3.3).

Rules summarizing the processes affecting /t/ are given in (30).

(30) Rules affecting /t/

/t/ → [d] / N__C$_{[+voi]}$
[t] / elsewhere

3.3.2.8 Voiceless laminal stop /tʲ/

The laminal stop /tʲ/ in Tataltepec Chatino appears frequently and in many contexts. It appears as the voiceless stop [t̪ʲ] word-initially before vowels (31), intervocalically (32), and in some clusters not of the form /Nt̪ʲ[+voi]/ nor before a velar stop (33). As a stop it is produced with contact between the tongue blade and the alveolar ridge.

(31) Word-initial /tʲ/

tyakànʔ	/tʲakãʔ^{L}/	[tʲa̰kãʔ]	'necklace'
tyunò	/tʲuno^{L}/	[tʲunõ]	'crustacean sp. *endoco*'
tyoʔo	/tʲoʔo^{X}/	[tʲᵒʔo]	'lime (mineral)'
tyinkkòn	/tʲinkkõ^{L}/	[tʲinkõ]	'horsefly'

(32) Medial /tʲ/

katyá	/katʲa^{H}/	[ka̰tʲa]	'edible green'
kwatyàʔ	/kʷatʲaʔ^{L}/	[kʷa̰tʲaʔ]	'fox'
lkityonʔ	/lkitʲõʔ^{X}/	[ɬkitʲõʔ]	'belly button'
tityá	/titʲa^{H}/	[titʲa]	'squirrel'

(33) /tʲ/ in other clusters

nttyì	/ntʲtʲi^{L}/	[ⁿtʲi]	'in a little bit'
ktyì	/ktʲi^{L}/	[ktʲi]	'paper'
kwtyeèʔ	/kʷtʲeːʔ^{L}/	[kʷtʲeːʔ]	'ant'
stya	/stʲa^{X}/	[stʲa]	'fontanelle'
xtyaʔán	/ʃtʲaʔã^{H}/	[ʃtʲãʔã]	'mother'

The laminal stop appears as [dʲ] when preceded by a nasal segment and followed by a voiced segment such as a vowel (e.g. /ntʲuʔwe^{H}/ → [ⁿdʲuʔwe] 'piece') or a voiced consonant as in (34).

(34) /tʲ/ appears as [dʲ] after a nasal segment and before a voiced segment

ntyusì	/ntʲusi^{L}/	[ⁿdʲusi]	'God' < Sp. *dios*
ntyakâ	/ntʲ-aka^{0L}/	[ⁿdʲa̰ka]	'G.be/become'
ntyuʔwé	/ntʲuʔwe^{H}/	[ⁿdʲuʔwe]	'piece'

Before the velar stops /k kʷ/, the laminal stop surfaces as the affricate /t͡ʃ/ (§ 3.2.6), as seen in the forms like /ntʲkʷeʔẽ^{L}/ → [ntʃkʷ̃ʔẽ] 'fishhook' as in (35). Since obstruent-obstruent clusters in Tataltepec Chatino arose from the syncope of an intervening vowel (C_1C_2 < *C_1VC_2), and /t͡ʃ/ was far less common at this earlier stage (itself arising only from the effects of a preceding [+front] vowel (*ch* /t͡ʃ/ < *itz, *etz)) modern [tʃk(ʷ)] se-

quences are analyzed as /tʲk(ʷ)/ unless there is evidence of an affricate either in the Chatino etymon (e.g. *chka* /t͡ʃka^{X}/ < *chaka* /t͡ʃaka^{X}/ 'other') or in the source of a loanword (e.g. ^{0}*chkulà* /t͡ʃkula$^{0\text{-}L}$/ < Sp. *chocolate* 'chocolate').

(35) /tʲ/ appears as [tʃ] before velar stops

ntykweʔèn	/ntʲkʷeʔɛ̃^{L}/	[ntʃkʷɛ̃ʔɛ̃]	'fishhook'
^{0}*ntyka*	/ntʲ-ka$^{0\text{-}X}$/	[ntʃka]	'H.be/become'
tykwiín	/tʲkʷĩː^{H}/	[tʃkʷĩː]	'road'

The rules affecting the realization of /tʲ/ are given in (36)

(36) Rules affecting /tʲ/

/tʲ/ → [dʲ] / N__[+voi]

[tʃ] / __ [-son, -cont, -cor]

[tʲ] / elsewhere

Figure 3.8 shows a few examples of [tʲ] in the phrase ^{0}*tyaàʔ ktyín cháʔ* ^{0}*tyuʔu tya* /tʲaːʔ$^{0\text{-}L}$ ktʲĩ^{H} t͡ʃaʔ^{H} tʲ-uʔu$^{0\text{-}X}$ tʲa^{X}/ (P.be_made intake COMP P.go_out water) 'an intake will be built so that water will enter [the irrigation canal]'.

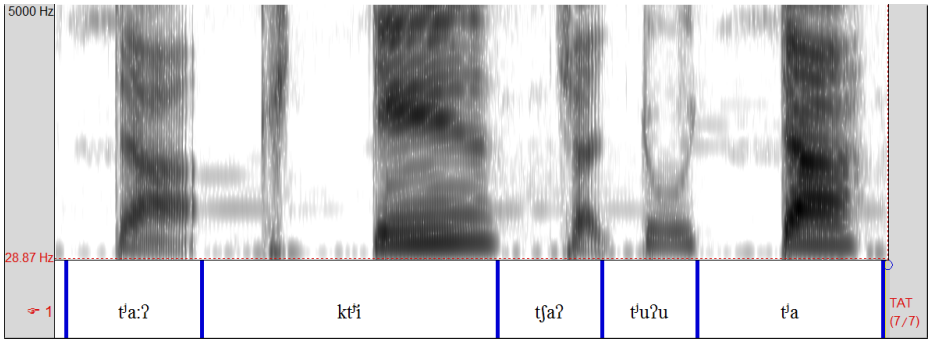


Figure 3.8: Spectrogram of [tʲ] in ^{0}*tyaàʔ ktyín cháʔ* ^{0}*tyuʔu tya*

Figure 3.9 shows an example of the voiced laminal stop [dʲ] in the word *⁰ntyaa nku?* /ntʲ-aː⁰-X=nku?X/ (C.NB-go=3PL) 'they went'.

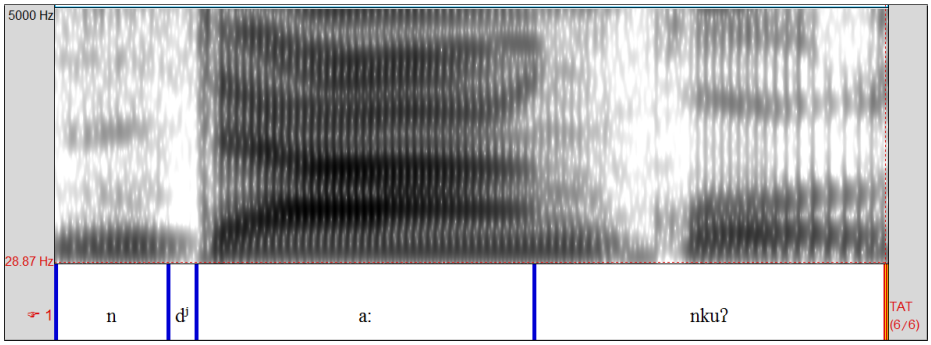


Figure 3.9: Spectrogram of [dʲ] in *⁰ntyaa nku?*

Figure 3.10 shows the affrication of /tʲ/ before a velar consonant in the phrase *ntykwi? xkichá?* /ntʲ-kʷiʔX ʃki-t͡ʃaʔH/ (H-speak PSD-word) 'speaks his language'.

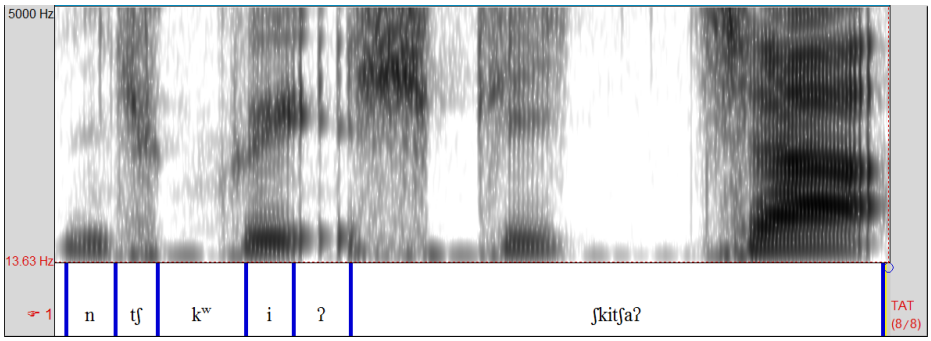


Figure 3.10: Spectrogram of [tʃ] in *ntykwi? xkichá?*

There are no restrictions on what vowels /tʲ/ may occur beside, and the absence of /otʲ, utʲ, etʲ/ sequences is considered a historical accident, since /tʲ/ has its origins in *it and *et sequences, which surface today as /(i)tʲ/ and /(a)tʲ/. The laminal stop /tʲ/ does not occur before the coronal sonorants (§ 4.3.3).

3.3.2.9 Voiceless bilabial plosive /p/

The voiceless bilabial plosive /p/ occurs somewhat infrequently in native vocabulary but is more common in loan vocabulary. /p/ appears in most contexts (word-initially before vowels (37), intervocallicaly (38), and in clusters not of the form /NpC$_{[+voi]}$/ (39)) as the voiceless bilabial stop [p].

(37) Word-initial /p/

pii	/piː^{X}/	[piː]	'turkey hen'
piti	/piti^{X}/	[piti]	'small (SG)'
panà	/pana^{L}/	[pa̰nɑ̃]	'but'
pojò	/poho^{L}/	[poho]	'throat'
tyjo ^{0}perù	/tʲho^{X} peru$^{0\text{-}L}$/	[tʲho peru]	watermelon' < Coastal Mixtec *peruu*

(38) Medial /p/

tyupeèʔ	/tʲupeːʔ^{L}/	[tʲupeːʔ]	'*güicho*'
^{0}stapà	/stapa$^{0\text{-}L}$/	[sta̰pa]	'Ixtapan' (Sp. /istapan/)

(39) /p/ in other clusters appears as [p]

^{0}xpatù	/ʃpatu$^{0\text{-}L}$/	[ʃpa̰tu]	'shoe' < Sp. *zapato*
ple	/ple^{X}/	[ple]	'stupid' < Sp. *simple*
^{0}mpkeè	/mpkeː$^{0\text{-}L}$/	[^{m}pkeː]	'Miguel'
mptyànʔ	/mptʲãʔ^{L}/	[^{m}ptʲɑ̃ʔ]	'earwig'
^{0}prikuʔ	/pɾikuʔ$^{0\text{-}L}$/	[pɾikuʔ]	'parakeet' < Sp. *perico*

/p/ appears as the voiced bilabial stop [b] when preceded by a nasal segment and followed by voiced segment, as shown in (40).

(40) /p/ appears as [b] after nasal segments and before voiced segments

mpaà	/mpaː^{L}/	[^{m}baː]	'co-father' < Sp. *compadre*
^{0}tyampù	/tʲampu$^{0\text{-}L}$/	[tʲa̰mbu]	'time' < Sp. *tiempo*
^{0}mplinyì	/mplinʲiʲ$^{0\text{-}L}$/	[^{m}blinʲĩ]	'melon' < Sp. *melón*
mplusá	/mplusa$^{0\text{-}L}$/	[^{m}blusa]	'blouse' < Sp. *blusa*

The allophonic forms of /p/ are summarized in the rule in (41).

(41) Rules affecting /p/

/p/ → [b] / N__[+voi]
[p] / elsewhere

Unlike the other non-laryngeal stops, /p/ is fairly restricted in its distribution. In native, non-sound symbolic roots, it only precedes /tʲ/ (in *mptyàn?* /mptʲãʔᴸ/ 'earwig')[6]. In non-native vocabulary /p/ can appear in more contexts, though its distribution is still limited: it can follow a nasal segment or the fricatives /s ʃ/ and precede the liquids /l lʲ ɾ/ and the stops /tʲ k/.

/p/ also occurs in clusters before stops as in *mptyàn?* /mptʲãʔᴸ/ 'earwig' and *⁰mpkeè* /mpkeː⁰⁻ᴸ/ 'Miguel'. These stops are consistently pronounced by speakers, but are possibly emergent stops (Ohala, 2005) arising from the transition between the nasal and the heterorganic stop (i.e. /mtʲãʔᴸ/ → [mptʲãʔ]). This is further supported by the absence of a labial stop in the sources of the loans *⁰mpkeè* /mpkeː⁰⁻ᴸ/ 'Miguel' and *⁰mplinyì* /mplinʲiː⁰⁻ᴸ/ 'melon'. Though these lexemes likely did not include /p/ at some earlier stage (i.e. */mkeː⁰⁻ᴸ/ and */mlinʲiː⁰⁻ᴸ/), the resulting triconsonantal sequences are valid consonant clusters in Tataltepec Chatino today and are uniformly pronounced by speakers, and therefore I analyze these forms as having bilabial stops in their phonological representations.

/p/ is expected to not occur before a [+ labial] vowel in native vocabulary (§ 4.3.5), but it is found there in only one word: *pojò* /pohoᴸ/ 'throat'.[7] In native vocabulary /p/ only

[6]The peculiar /ptʲ/ (or perhaps a historic *mtʲ) cluster suggests that this form may be a loan, perhaps from a Southern Zapotec language which features *mb-* or *m-* prefixes on animal terms.

[7]This lexeme is also exceptional in Zenzontepec Chatino, but for a different reason. In that language, 'throat' is *pajō*, and is a violation of the generalization in that language that vowel quality is mirrored across

follows the vowel /u/, and in only one word: *tyupeèʔ* /tʲupeːʔᴸ/ for the bird known in local Spanish as *güicho*. Apart from the near-total restriction on [+ labial] CV sequences, all other gaps in /p/'s distribution are considered to be accidental.

Figur 3.11 shows a spectrogram of a typical instance of [p] in the phrase *no ⁰lusuʔ pa wiʔ* /noˣ lusuʔ⁰⁻ˣ+paˣ wiʔˣ/ (NOM magpie DEM:AFMN) 'that magpie',[8] and Fig. 3.12 shows a spectrogram of typical instance of [b] in the phrase *ska mpaà ya* /skaˣ mpaːᴸ=jaˣ/ (one co-father=1EX) 'one of our co-fathers'. Note the voicing throughout the closure of [b] in *mpaà*.

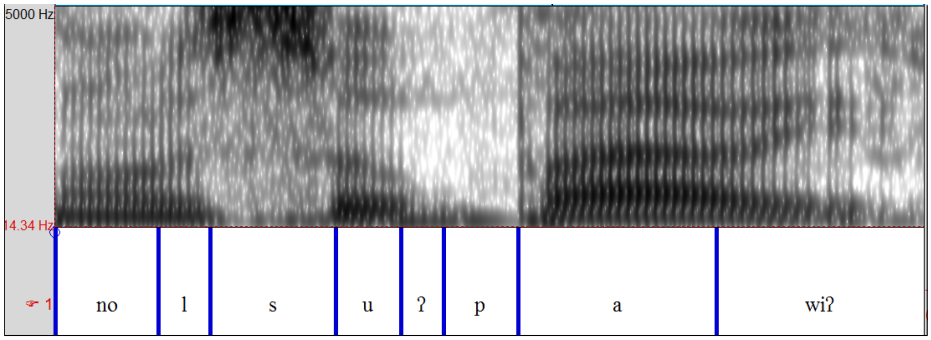


Figure 3.11: Spectrogram of [p] in *⁰lusuʔ pa*

3.3.3 Affricates

In addition to a series of stops, Tataltepec Chatino has two affricates. Both are coronal, one plain /t͡s/ and the other laminal /t͡ʃ/ postalveolar. The affricates have similar dis-

laryngeal consonants (E. Campbell & Carleton, in press).

[8]This word is somewhat unusual. Magpies (*urraca* or *burraca* regional Spanish) are known as *lusūʔ* in Zenzontepec Chatino, where the word refers to the white-thoated magpie-jay *Calocitta formosa*. This may be the same *pájaro carpetona* known in Yaitepec Eastern Chatino as *cha³ suʔ¹⁴*. No bird is known simply as *lusuʔ* in Tataltepec Chatino, and it is unclear what meaning *pa* has.

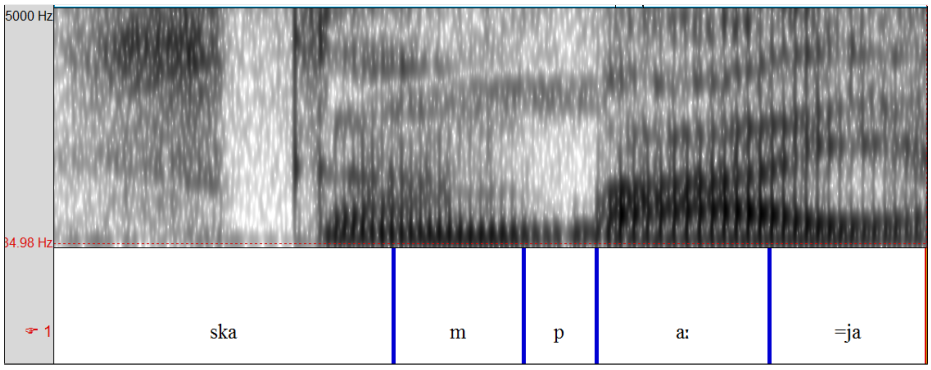


Figure 3.12: Spectrogram of [b] in *mpaà*

tributions to the stops, though they have distinct behavior with regard to the post-nasal voicing process (§ 3.2.3).

3.3.3.1 The plain coronal affricate /ts/

The affricate /t͡s/ is common in native roots in Tataltepec Chatino, and can be found in many contexts including word-initially before vowels (42), intervocalically (43), and in clusters (44). Unlike what is observed with stops, the affricate does not appear voiced after a nasal segment and before a voiced sound.

(42) Word-initial /ts/

tzaan	/t͡sã:^{X}/	[tsɑ̃:]	'day'
^{0}tziyaan	/t͡sijã:$^{0\text{-}X}$/	[tsijɑ̃:]	'Temascaltepec'
tzuʔna	/t͡suʔna/	[tsuʔnɑ̃]	'scarce'
tzaʔnya	/t͡saʔnʲa^{X}/	[tsɑ̨ʔnʲɑ̃]	'cheap'
^{0}tzoʔo	/t͡soʔo$^{0\text{-}X}$/	[ts^{o}ʔo]	'good'

(43) Medial /ts/

kwatzíʔ	/kʷatsiʔ^{H}/	[kʷa̱tsiʔ]	'iguana'
^{0}nkatzi	/nkatsi$^{0\text{-}X}$/	[ᵑgą̱tsi]	'yellow'
^{0}tykatzòn	/tʲkatsõ$^{0\text{-}L}$/	[tʃką̱tsõ]	'lukewarm'
ntatzi	/ntatsi^{X}/	[ⁿdą̱tsi]	'*nanche*'

(44) /ts/ in clusters

kwentzaka	/kʷen͡tsaka^{X}/	[kʷentsą̱ka]	'bird (sp.)'
kwtzì	/kʷ͡tsi^{L}/	[kʷ̰tsi]	'groom'
^{0}ltzeʔ	/l͡tseʔ$^{0\text{-}X}$/	[ɬtseʔ]	'tongue'
tzwiíʔ	/͡tswi:ʔ^{H}/	[tswi:ʔ]	'a few days ago'
ntzeènʔ	/nt͡sẽ:ʔ^{L}/	[ntsẽ:ʔ]	'multispotted goby (*jalmiche*)'

The affricate /t͡s/ does not occur before other stops, where /s/ is found instead (§ 3.2.5). Only velar stops occur in this context where /t͡s/ is realized as /s/.

Rules summarizing the processes affecting /t͡s/ are given in (45).

(45) Rules affecting /t͡s/

/t͡s/ → [s] / __C$_{[\text{-son}]}$
[ts] / elsewhere

Figure 3.13 shows an example of the affricate [ts] in *nkwlatzúʔ nkuʔ* /nkʷ-lat͡suʔ^{H}=nkuʔ^{X}/ (C-remove=3PL) 'they took (it) away'.

There are no restrictions on which vowels /t͡s/ may occur beside, and the absence of /t͡sĩ/ sequences is considered accidental, and that /a/ is the only vowel which precedes /t͡s/ is a result of historical process in which *et͡s and *it͡s sequences would result in modern /(V)t͡ʃ/ sequences and *ut͡s, *ot͡s sequences were typically lost due to syncope. /t͡s/ does not have a wide distribution alongside other consonants as it is only found preceding /w/ and after velar stops /k kʷ/ or coronal sonorants /l n/.

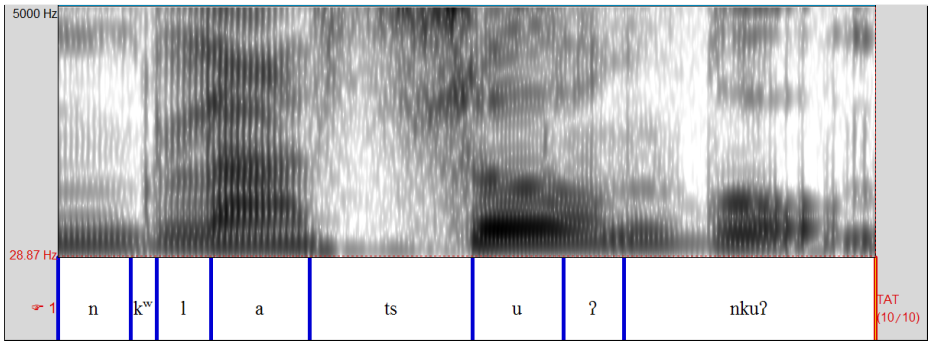


Figure 3.13: Spectrogram of [ts] in *nkwlatzúʔ*

3.3.3.2 The laminal affricate /t͡ʃ/

The voiceless laminal affricate /t͡ʃ/ occurs frequently in native vocabulary in Tatal-tepec Chatino. It occurs in various contexts including word-initially before vowels (46), intervocallically (47), and in clusters (48). It is produced as a voiceless alveopalatal af-fricate [tʃ] in all contexts.

(46) Word-initial /t͡ʃ/

chanyìʔ	/t͡ʃanʲiʔ^{L}/	[tʃạnʲĩʔ]	'snail'
chijyaʔ	/t͡ʃijaʔ^{X}/	[tʃiçaʔ]	'México, D.F.'
chúʔ	/t͡ʃuʔ^{H}/	[tʃuʔ]	'coati'
chuniʔīˈ	/t͡ʃuniʔi$^{H\underline{L}}$/	[tʃunˈʔĩ]	'scorpion'

(47) Medial /t͡ʃ/

lkichiʔ	/lkit͡ʃiʔ^{X}/	[ɬkitʃiʔ]	'stuffed'
wichîʔ	/wit͡ʃiʔ^{0L}/	[βi̤tʃiʔ]	'son!'
xkicháʔ	/ʃki-t͡ʃaʔ^{H}/	[ʃkitʃaʔ]	'language'
tacha	/tat͡ʃa^{X}/	[tạtʃa]	'tight'

(48) The /tʃ/ affricate in clusters

nchòn?	/nt͡ʃõʔ^{L}/	[ntʃõʔ]	'young ear of maize'
kwchí	/k^{w}t͡ʃi^{H}/	[k^{w}tʃi]	'jaguar, small mammal'
wchá	/wt͡ʃa^{H}/	[ɸtʃa]	'day after tomorrow'
tanchu	/tant͡ʃu^{X}/	[tạntʃu]	'billy goat' < Nah. *tēntzon(-tli)* 'beard'

Figure 3.14 shows examples of [tʃ] in the phrase *chá? k-^{0}aka kchen wi?* /t͡ʃaʔ^{H} k-aka$^{0\text{-}X}$ kt͡ʃẽ^{X} wiʔ^{X}/ (COMP P-be town DEM:AFMN) 'so that that town would be'.

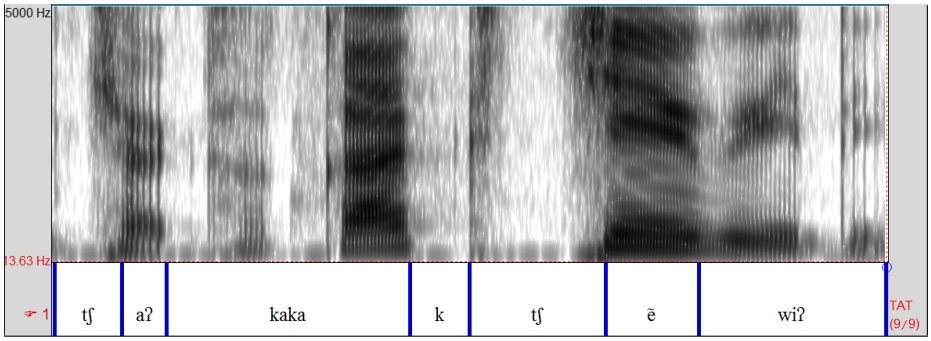


Figure 3.14: Spectrogram of [tʃ] in *chá? ^{0}kaka kchen wi?*

There are no restrictions on what vowels /t͡ʃ/ may occur beside, and the absence of /ot͡ʃ/, ut͡ʃ, et͡ʃ/ sequences is considered a historical accident, since /t͡ʃ/ has its origins in *it͡s and *et͡s sequences, which surface today as /(i)t͡ʃ/ and /(a)t͡ʃ/. The laminal affricate does not occur before any consonants (except for in loans like ^{0}*chkulà* 'chocolate'), and occurs only after /w/, the velar stops /k k^{w}/ and the nasals /m n/.

3.3.4 Fricatives

Tataltepec Chatino has four fricative consonant phonemes at the labial, alveolar, postalveolar and laryngeal points of articulation, three of which {s ʃ h} are common in native vocabulary, and the fourth /f/ is found only in nativized loans and as a replacement for the

native cluster /hw/ ([hɸ] ∼ [ɸ]) for some younger speakers. Another phoneme /j̊/ is phonetically a fricative [ç] but patterns as a glide. Still another fricative phone [ɬ] is present in the language as an allophone of the lateral /l/ phoneme.

The laryngeal fricative can form clusters with sonorant consonants. When /h/ is the first member of such clusters, the sonorant is produced as devoiced for the first portion of the sonorant's duration (§ 3.2.4).

3.3.4.1 The laryngeal /h/

The other laryngeal consonant in Tataltepec Chatino is the fricative /h/. This appears as a voiceless fricative [h] when preceding vowels both word-initially (49), intervocallically (50), and in clusters following obstruents (51).

(49) Word-initial /h/

jaàʔ	/haːʔ^{L}/	[haːʔ]	'reed mat'
joon	/hõː^{X}/	[hõː]	'spike'
jaʔwá	/haʔwa^{H}/	[hạʔwa]	'corncrib'
jakwā	/hak^{w}a$^{H\underline{L}}$/	[hạk^{w}a]	'four'

(50) Medial /h/

tyaja	/tʲaha^{X}/	[tʲaha]	'tortilla'
tyojo	/tʲoho^{X}/	[tʲoho]	'squash'
kwnejonʔ	/k^{w}nehõʔ^{X}/	[k^{w}nehõʔ]	'rabbit' Sp. *conejo*
^{0}tajù	/tahu$^{0\text{-}L}$/	[tahu]	'group' Sp. *hatajo*
^{0}brajù	/β̞rahu$^{0\text{-}L}$/	[β̞rahu]	'skirt' Sp. *refajo*

(51) /h/ in clusters

ntjan	/nthã^{X}/	[nthã]	'bark'
kwjí	/k^{w}hi^{H}/	[k$^{w̥}$hi]	'skunk'
tjaà	/thaː^{L}/	[thaː]	'lazy'

In the majority of the lexicon the vowels on either side of [h] will be identical, though a few terms, mostly recent loans like *^{0}tajù* /tahu$^{0\text{-}L}$/ [tahu] 'group' < Sp. *hatajo* and *^{0}brajù* /β̬rahu$^{0\text{-}L}$/ [β̬rahu] 'skirt' < Sp. *refajo*, have dissimilar vowels.

As mentioned in § 3.2.4, /h/ forms clusters with sonorants, and when /h/ precedes a sonorant in these clusters, the sonorant is partially devoiced, as seen in (52).

(52) /h/+ sonorant sequences appear as voiceless sonorants

jloʔô	/hloʔo^{0L}/	[(h)l̥^{o}ʔo]	'Tataltepec'
jnaàʔ	/hna:ʔ^{L}/	[(h)n̥ã:ʔ]	'NSUBJ.1SG'
jwaʔǎn	/hwaʔã^{0}/	[(h)ʍ^{ã}ʔã]	'thus'

A rule summarizing the behavior of /h/ is given in (53)

(53) Rules affecting /h/

/hC$_{[+son]}$/	→	C$_{[-voi]}$	
/hw/	→	ʍ	(optional)

While a period of [h]-like noise after a stop could be considered aspiration (i.e. *tjaà* 'lazy' could be transcribed as [t^{h}a:] rather than [tha:]), these sounds are considered to be segments in Tataltepec Chatino because of variation in the production of these /Ch/ sequences. Many cases of /h/ in Ch clusters are the result of the syncopation of the first vowel of a CVhV sequence. For example, 'salt' is typically produced as a monosyllable in contemporary TAT (*tjeʔ* /theʔ^{X}/), but descends from a disyllabic form (cf. ZEN *tejeʔ* [te.heʔ]). Occasionally, speakers will produce disyllabic form of what are analyzed here as /ChV/ monosylables, e.g. *tjeʔ* /theʔ^{X}/ [theʔ] ∼ *tejeʔ* /tehеʔ^{X}/ [te.heʔ] 'salt'. Much like with the variable realizations of intervocalic /ʔ/, there is no evidence for a morphophonological explanation of where one form or the other occurs, but the tonal behavior of /ChV/ as a

monosyllable and not a disyllable[9] suggests that these forms lack vowels in the Tataltepec Chatino lexicon, or that some speakers have two forms of these words (/CVhV/ and /ChV/) in their mental lexica.

3.3.4.2 Voiceless alveolar fricative /s/

The alveolar fricative /s/ appears often in Tataltepec Chatino in many contexts: word-initially before vowels (54), intervocallically (55), and in clusters (56).

(54) Word-initial /s/

saʔà	/saʔa^{L}/	[s^{a}ʔa]	'lover'
siʔyù	/siʔju^{L}/	[siʔju]	'tray'
seèn	/sẽː^{L}/	[sẽː]	'wide'

(55) Medial /s/

^{0}jwesè	/hwese$^{0\text{-}L}$/	[ɸese]	'civil official' < Sp. *juez*
lusu	/lusu^{X}/	[lusu]	'beard'

(56) /s/ in clusters

^{0}ksùʔ	/ksuʔ$^{0\text{-}L}$/	[ksuʔ]	'old'
nsatyá	/nsatʲa^{H}/	[nsa̰tʲa]	'basilisk lizard'
styenʔ	/stʲẽʔ^{X}/	[stʲɛ̃ʔ]	'chewing louse'
sloò	/sloː^{L}/	[sloː]	'one's place'

Figure 3.15 shows an example of [s] in the phrase *su k-^{0}aka kchen* /su^{X} k-aka$^{0\text{-}X}$ kt͡ʃẽ^{X}/ (place P-be town) 'the place where a town will be'.

[9] A monosyllable like *^{0}kjò* /kho$^{0\text{-}L}$/ 'lame' (< Sp. *cojo*) will appear with a sharp falling contour with the superhigh tone is linked [kho᷄] like other CV words, rather than a simple low tone, which might be expected if the word was phonologically a disyllable whose first vowel was simply obscured by the release of the [k] and the noise of [h]. In fact this word is produced as a disyllable (*^{0}kojò* /koho$^{0\text{-}L}$/) by some speakers. When the superhigh tone is linked, these speakers produce a sharp rise on the first vowel and a simple low tone on the final vowel [ko˧ho˩] like other disyllabic words.

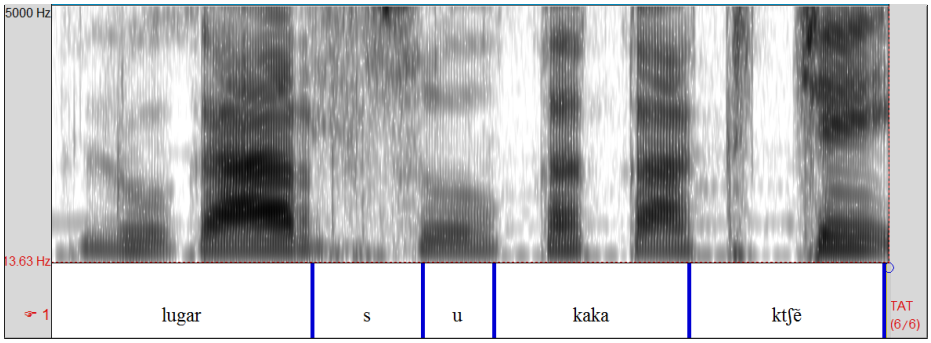


Figure 3.15: Spectrogram of [s] in *su*

There are no restrictions on the distribution of /s/. The absence of /es/ and /is/ sequences is a consequence of the historic laminalization process in which *es and *is became /(a)ʃ/ and /(i)ʃ/. This is not a synchronic restriction as /s/ is found after /e/ and /i/ in loan words.

3.3.4.3 Voiceless alveopalatal fricative /ʃ/

The laminal fricative /ʃ/ appears often in Tataltepec Chatino in many contexts: word-initially before vowels (57), intervocallically (58), and in clusters (59). It is produced as a voiceless alveopalatal fricative [ʃ] in all contexts.

(57) Word-initial /ʃ/

xakwî	/ʃakʷi^{0L}/	[ʃa̰kʷi] 'pheasant'
xeé	/ʃeː^{H}/	[ʃeː] 'light'
xuʔná	/ʃuʔna^{H}/	[ʃuʔnã] 'owner'

(58) Word-medial /ʃ/

kwlaxu	/kʷlaʃu^{X}/	[kʷla̰ʃu] 'buzzard'
kwlixí	/kʷliʃi^{H}/	[kʷliʃi] 'butterfly'
nklixènʔ	/ŋgliʃɛ̃ʔ^{L}/	[ᵑgliʃɛ̃ʔ] 'roofing slat'
wixônʔ	/wiʃõʔ^{0L}/	[βi̤ʃõʔ] 'daughter!'

(59) /ʃ/ in clusters

xlyatén	/ʃlʲatẽ^{H}/	[ʃlʲa̰tẽ]	'nest'
xtyeʔen	/ʃtʲẽʔẽ^{X}/	[ʃtʲẽ^{ʔ}ʔẽ]	'tail'
xnèʔ	/ʃneʔ^{L}/	[ʃnẽʔ]	'dog'
kwxàʔ	/kʷʃaʔ^{L}/	[kʷʃaʔ]	'wedding gift'

Figure 3.16 shows an examples of [ʃ] in a spectrogram of the phrase *loʔó xtanyì wiʔ* /loʔo^{H} ʃtanʲi^{L} wiʔ^{X}/ (with/and name DEM:AFMN) 'and that name'.

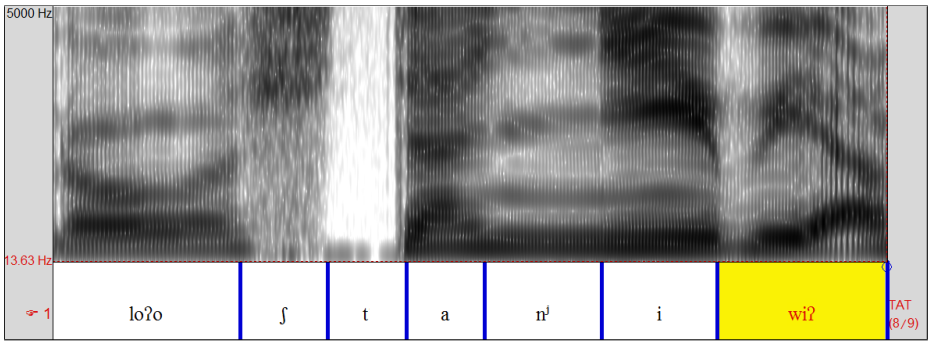


Figure 3.16: Spectrogram of [ʃ] in *loʔó xtanyì wiʔ*

There are no restrictions on which vowel /ʃ/ may occur beside, though /eʃ oʃ uʃ/ sequences are not observed in native vocabulary, which is likely a produce of a historic lowering of penultimate *e, the general rarity of unstressed mid vowels, and penultimate /u/'s propensity to be deleted by syncope. The absence of /ʃã/ sequences is likely an accidental gap. /ʃ/ does not appear to be restricted in its distribution alongside other consonants relative to other fricatives.

3.3.4.4 Voiceless labiodental fricative /f/

A rare phoneme found in partially-nativized loans is the voiceless bilabial fricative /f/. It is considered to be a phoneme of contemporary Tataltepec Chatino and not just a

part of its loan phonology since it remains in words which have undergone other segmental accommodations to Tataltepec Chatino's phonology. One such word, which is pronounced as [f] by nearly all speakers is *nkuʔ fransè* /nkuʔ^{X} fɾanse^{L}/ '*gringo*'[10] < Sp. *francés* 'French', which contains not only the class term *nkuʔ* 'people', but also has accomodated to Tataltepec Chatino phonotactics by deleting the /s/ coda.[11] Other loans into Tataltepec Chatino containing [f] or [fw] in their source show /hw/ rather than /f/, as with *^{0}jwarsà* /hwaɾsa$^{0\text{-}L}$/ < Sp. *fuerza* /ˈfweɾsa/. Speakers disagree as to whether 'coffee' (< Sp. *café* /kaˈfe/) is *^{0}kajwè* /kahwe$^{0\text{-}L}$/ or *^{0}kafè* /kafe$^{0\text{-}L}$/, though the /f/ variant appears more common. Some younger speakers (who might be considered semi-speakers) appear to be replacing /hw/ clusters with /f/ in their productions, replacing [hɸ] or [ɸ] with [f].

Figure 3.17 shows an example of [f] in a spectrogram of the phrase *nty-aʔàn ^{0}xuu ^{0}kafè nǐ* /nt^{j}-aʔã^{L} ʃuː$^{0\text{-}X}$ kafe$^{0\text{-}L}$ ni^{0}/ (C.NB-go.1SG pick_fruit coffee AFF) 'I went to pick coffee'.

3.3.5 Nasals

Tataltepec Chatino has three phonemic nasal consonants {m n n^{j}}, though an additional [ŋ] phone is heard in the language due to the place assimilation of non-labial nasal segments before obstruents (§ 3.2.1). Like other Chatino languages the nasals cause a following voiceless stop to be produced as a voiced stop (if followed by another voiced

[10] In the context of Tataltepec, *gringo* is meant to identify light-skinned non-Mexicans who are prototypically (but not necessarily) anglophone and North American.

[11] Contrast this to the more recent *cháʔ inglés* /t͡ʃaʔ^{H} inkles^{X}/ [tʃaʔiŋgles] (word English) 'English language' where the second element is nearly entirely phonologically Spanish and contains a coda consonant not permissible in Tataltepec Chatino. One older male speaker (b. ca. 1930) had /mpɾanse^{L}/ [^{m}bɾanze] rather than /fɾanse^{L}/ for 'gringo', which was also peculiar for having a voiced alveolar fricative after the /n/, which was found nowhere else in the corpus.

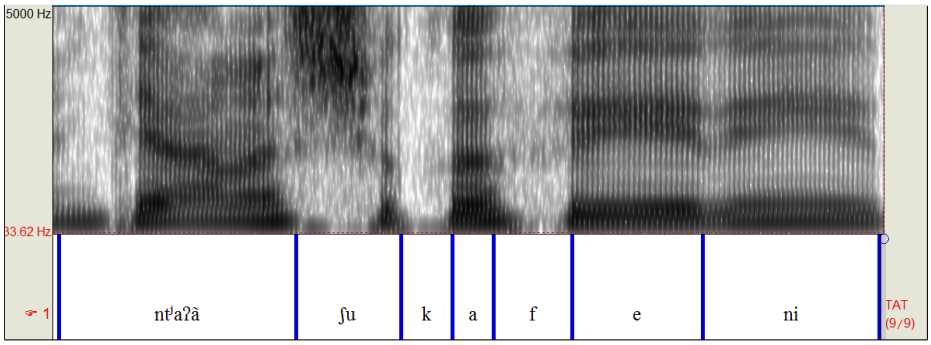


Figure 3.17: Spectrogram of [f] in *ntyaʔàn xu kafè ní*

sound). Thus, the nasals are the only sonorants to not devoice between the edge of a word and a voiceless obstruent. When preceding a stop and another voiced segement, these nasals cause the stop to assimilate the voicing of the $\left[\begin{smallmatrix}+\text{nas}\\+\text{voi}\end{smallmatrix}\right]$_[+ voi] environment and surface as a voiced stop (§ 3.2.3).

3.3.5.1 Voiced dental nasal /n/

The voiced dental nasal /n/ appears quite frequently in the lexicon of Tataltepec Chatino, and occurs as [n] in many contexts, including word-initially before vowels (60), intervocalically (61), and in many clusters (62).

(60) Word-initial /n/

nèʔ	/neʔ^{L}/	[nɛ̃ʔ]	'belly'
naʔà	/naʔa^{L}/	[n$^{a̰}$ʔã]	'C.see'
niì	/niː^{L}/	[nĩː]	'today'

(61) Medial /n/

yaná	/jana^{H}/	[jạnã]	'corncob'
tyunò	/tʲuno^{L}/	[tʲunõ]	'*Macrobrachium* sp.'
ntana	/ntana^{X}/	[^{n}dạnã]	'soot'
konòʔ	/konoʔ^{L}/	[konõʔ]	'worm'

(62) /n/ in clusters

nkasàʔ	/nkasaʔ^{L}/	[^{ŋ}gạsaʔ]	'ortolan'
nskwàʔ	/nsk^{w}aʔ^{L}/	[^{n}sk^{w}aʔ]	'maize'
snóʔ	/snoʔ^{H}/	[snõʔ]	'eight'
kwnaʔá	/k^{w}naʔa^{H}/	[k^{w}n$^{ɑ̃}$ʔɑ̃]	'woman'
tzuʔna	/t͡suʔna^{X}/	[tsuʔnɑ̃]	'scarce'

When following /h/, /n/ is devoiced and the sequence appears as [n̥] (63), though a more narrow transcription might be [n̥͡n] as the nasal is voiced for a portion of its duration immediately before the vowel (§ 3.2.4).

(63) /n/ appears as a voiceless nasal after /h/

jnaàʔ	/hna:ʔ^{L}/	[(h)n̥ɑ̃:ʔ]	'NSUB.1SG'
jnoʔō	/hnoʔo$^{H͡L}$/	[(h)n̥^{õ}ʔõ]	'NSUB.2SG'

Word-initially before an obstruent, /n/ appears with a much shorter duration than the nasal portion of a phonetically prenasalized obstruent. Nasals in this #_[-son] context are transcribed as [^{ŋ}C] to indicate this shorter duration. Phonemically, these nasal-stop sequences are clusters and not complex segments, as similar phonetic sequences have been analyzed in languages such as Fijian (§3.2.3). The /n/ phoneme also assimilates to the place of articulation of following consonants (§3.2.1).

Figure 3.18 shows an example of [n] both pre-vocallically and word-initially before a stop in *no nkúʔ* /no^{X} nkuʔ^{H}/ (NOM people) 'the people'. Note that the nasal occlusion is shorter word-initially before /k/ than before a vowel.

Rules affecting /n/ are given in (64).

(64) Rules affecting /n/

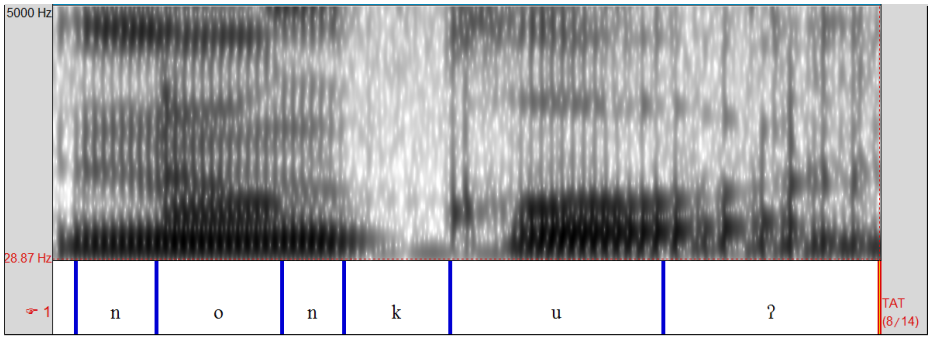


Figure 3.18: Spectrogram of [n] in *no nkúʔ*

/n/	→	[n̥]	/h__
		[ⁿ]	/#__C
		$N_{[\alpha \text{ place}]}$	/__$C_{[\alpha \text{ place}]}$
		[n]	/ elsewhere

3.3.5.2 Voiced laminal nasal /nʲ/

The laminal nasal is a common phoneme in Tataltepec Chatino, and occurs in many contexts, including word-initially before a vowel (65), intervocallically (66), and in clusters (67). In these contexts, a voiced nasal produced through with the tongue blade touching behind the alveolar ridge [nʲ]. While a laminal nasal can be heard as the nasal portion of a phonetically prenasalized laminal obstruent, as in *ntyuʔwé* /ntʲuʔwe^{H}/ [ⁿdʲuʔwe] 'piece', these are the result of place assimilation of a nasal to the following obstruent (§ 3.2.1), and are considered to be underlyingly plain coronal nasals rather than laminal nasals.

(65) Word-initial /nʲ/

nya	/nʲa^{X}/	[nʲã]	'griddle'
^{0}nyatèn	/nʲatẽ$^{0\text{-}L}$/	[nʲạtẽ]	'people'
nyí	/nʲi^{H}/	[nʲĩ]	'season'

(66) Medial /nʲ/

kinyì	/kinʲiᴸ/	[kinʲĩ]	'songbird'
kwinyáʔ	/kʷinʲaʔᴴ/	[kʷinʲãʔ]	'deer'
kwanyá	/kʷanʲaᴴ/	[kʷa̰nʲã]	'snake'
sanyì	/sanʲiᴸ/	[sa̰nʲĩ]	'guitar'

(67) /nʲ/ in clusters

knyìʔ	/knʲiʔᴸ/	[knʲĩʔ]	'salty'
⁰xnyiʔi	/ʃnʲiʔi⁰⁻ˣ/	[ʃnʲĩʔĩ]	'devil'
tzaʔnya	/t͡saʔnʲaˣ/	[tsa̰ʔnʲã]	'cheap'
kwxiʔnyà	/kʷʃiʔnʲaᴸ/	[kʷʃiʔnʲã]	'tile'
snyiʔ	/snʲiʔˣ/	[snʲĩʔ]	'offspring'

Figure 3.19 shows an example of [nʲ] in a spectrogram of the phrase *⁰ka kinyì* /ka⁰⁻ˣ kinʲiᴸ/ (toward songbird) 'to Tututepec'.

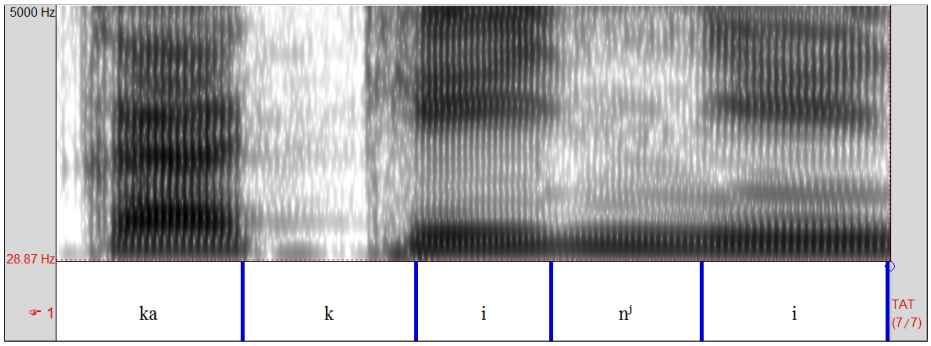


Figure 3.19: Spectrogram of [nʲ] in *⁰ka kinyì*

/nʲ/ is somewhat limited in its distribution around vowel, as it only occurs after /a i/ in native vocabulary. This is due to /nʲ/'s origin in historic *in and *en sequences which lead to modern /(i)nʲ/ and /(a)nʲ/ sequences.

Rules affecting /nʲ/ are listed in (68).

(68) Rules affecting /nʲ/

/nʲ/	→	[n̥ʲ]	/h__
		[nʲ]	/ elsewhere

3.3.5.3 Voiced bilabial nasal /m/

The bilabial nasal /m/ appears infrequently in native vocabulary and more frequently in loans. In all contexts, including word-initially before vowels (69), intervocalically (70), and in clusters (71), /m/ appears as a voiced bilabial nasal [m].

(69) Word-initial /m/

ya mityeéʔ	/ya^{X} mitʲe:ʔ^{H}/	[ja mitʲe:ʔ]	'lime tree'
mā	/ma$^{H\bar{L}}$/	[mã]	'where?'
^{0}mesà	/mesa$^{0\text{-}L}$/	[mesa]	'table' < Sp. *mesa*

(70) Medial /m/

chumi	/t͡ʃumi^{X}/	[tʃumĩ]	'cat' < JAM, TUT. *chumi*
memèʔ	/memeʔ^{L}/	[memɛ̃ʔ]	'antlion'
ntimá	/ntima^{H}/	[^{n}dimã]	'Dimas'
^{0}yumà	/juma$^{0\text{-}L}$/	[jumã]	'spirit' < ?Sp. *ánima*

(71) /m/ in clusters

mpaà	/mpa:^{L}/	[^{m}ba:]	'co-father' < Sp. *compadre*
^{0}msanà	/msana$^{0\text{-}L}$/	[^{m}sn̥ã]	'apple' < Sp. *manzana*
^{0}tminkkù	/tminkku$^{0\text{-}L}$/	[tminku]	'Sunday' < Sp. *domingo*
^{0}nsmii	/nsmi:$^{0\text{-}X}$/	[nsmĩ:]	'citrus'

Word-initially before an obstruent, the duration of the nasal can be quite short, leading to the transcription of /mCV/ sequences as phonetically prenasalized [^{m}CV] to reflect the shorter durations of the nasal in these contexts, as laid out in the rule in (72).

(72) Rules affecting /m/

/m/ → [^{m}] / #__C$_{[-son]}$
[m] / elsewhere

Figure 3.20 shows a representative spectrogram of a medial /m/ in the phrase ^{0}*tyala* ^{0}*lyumà liʔ* /tʲ-ala$^{0\text{-}X}$ lʲuma$^{0\text{-}L}$ liʔ^{X}/ (P-arrive deceased_spirit then) 'then the spirits of the deceased will return'.

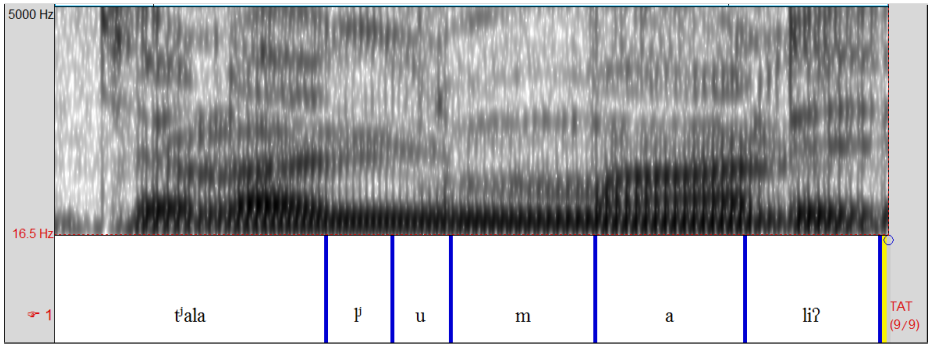


Figure 3.20: Spectrogram of [m] in ^{0}*lyumà*

In native vocabulary /m/'s distribution is quite restricted. It is only ever forms clusters with /p/ (*mptyànʔ* /mptʲãʔ^{L}/ 'earwig'), /s/ (textit^{0}smii /smi:$^{0\text{-}X}$/ 'citrus'), and /ʔ/ (*koʔmă* /koʔma^{0}/ 'macaw' and *kuʔma* /kuʔma^{X}/ '2PL'). Both of these last clusters are the result of the historic nasalization of *w before nasal vowel (cf. ZAC *nkoʔwan* /nkoʔwã/ '2PL').[12]

Since it is a [+ labial] consonant, /m/ does not occur before /o u õ/ (§ 4.3.5). /m/ only follows a vowel in one lexeme (*memèʔ* /memeʔ^{L}/ 'antlion') which is likely an accidental gap given /m/'s lower frequency in the lexicon.

[12] *Kuʔmă* 'macaw' is actually a very early loan into Proto-Zapotecan from a Mixe-Zoquean language, reconstructed for Proto-Zapotecan as *kweʔwa (Kaufman, 1993-2007).

3.3.6 Oral sonorants

Tataltepec Chatino has seven oral sonorants: two laterals {l lʲ}, a tap /ɾ/, three voiced glides {β̞ w j} and a voiceless glide /j̥/.

A voicing assimilation occurs when oral sonorants appear in clusters with voiceless obstruents (§ 3.2.4). Word-initially before a voiceless obstruent (an environment in which /ɾ/ does not occur) oral sonorants are produced as voiceless fricatives /l w j/ → [ɬ ɸ ç]. /j̥/ is phonetically a fricative [ç] in all contexts.

The following sections will discuss each of the consonant phonemes in turn, starting with the labials, and finishing with the laryngeal consonants.

3.3.6.1 Voiced lateral /l/

The plain coronal lateral /l/ appears in many roots. A voiced alveolar lateral [l] appears in several contexts: word-initially before vowels (73), intervocallically (74), and in clusters not of the form /hl/ or #lC$_{[-son, -cont]}$ (75).

(73) Word-initial /l/

lakeè	/lake:^{L}/	[lake:]	'tomorrow'
^{0}lusuʔ pa	/lusuʔ$^{0\text{-}X}$ pa^{X}/	[lusuʔpa]	'magpie'
lakaʔ	/lakaʔ^{X}/	[l̥akaʔ]	'leaf'

(74) Medial /l/

lkala	/lkala^{X}/	[ɬkl̥a]	'opaque'
kalá	/kala^{H}/	[kl̥a]	'twenty'
^{0}xkulaʔ	/ʃkulaʔ$^{0\text{-}X}$/	[ʃkulaʔ]	'hoof'

(75) /l/ in other clusters

klixén	/kliʃɛ̃^{H}/	[kliʃɛ̃]	'Yaitepec'
sloò	/slo:^{L}/	[slo:]	'one's place'
^{0}plè	/ple$^{0\text{-}L}$/	[ple]	'blanket'
^{0}nkwlaa	/nk^{w}la:$^{0\text{-}X}$/	[ᵑg^{w}la:]	'peach'
lwiì	/lwi:^{X}/	[lwi:]	'clean, neat'

After /h/ a voiceless lateral appears [l̥] (76). This lateral is partially voiced before the following vowel and a more appropriate narrow transcription may be [l̥l].

(76) /l/ appears as a voiceless lateral after /h/

^{0}jloo	/hlo:$^{0\text{-}X}$/	[l̥o:]	'know'
^{0}nkajlè	/nkahle$^{0\text{-}L}$/	[ᵑgąl̥e]	'angel' < Sp. *ángel*
jloʔô	/hloʔo^{0L}/	[l̥ᵒʔo]	'Tataltepec'

Word-initially before a voiceless segment, a voiceless lateral fricative [ɬ] appears (77).

(77) /l/ appears as a [ɬ] word-initially before a voiceless segment

lkwén	/lk^{w}ɛ̃^{H}/	[ɬk^{w}ɛ̃]	'image'
lti	/lti^{X}/	[ɬti]	'vine'
ltya	/lt^{j}a^{X}/	[ɬt^{j}a]	'maize ear'
ltzì	/l͡tsi^{L}/	[ɬtsi]	'Zacatepec'

Rules summarizing the processes affecting the alveolar lateral are given in (78).

(78) Rules affecting /l/

/l/ → [l̥] /h__
[ɬ] /#__ [-son / -cont]
[l] / elsewhere

Figure 3.21 provides an example of [l] in the phrase *kaʔyà l-^{0}aka no* /kaʔja^{L} l-aka$^{0\text{-}X}$ no^{X}/ (mountain S-be NOM) 'the mountain is the one that…'.

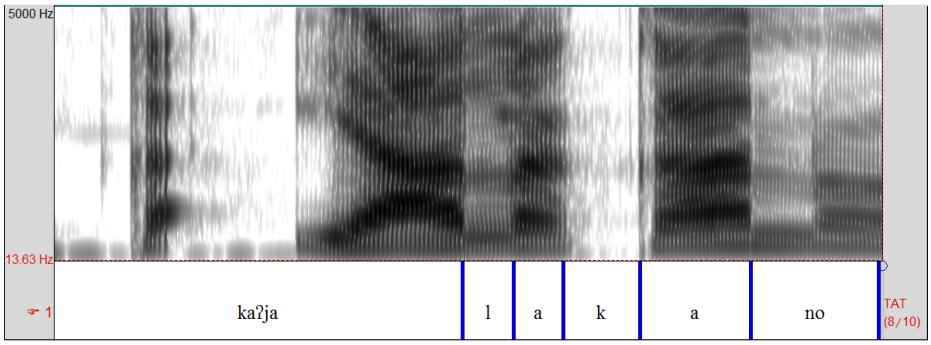


Figure 3.21: Spectrogram of [l] in *laka*

Figure 3.22 gives an example of a spectrogram of a /hl/ cluster in the phrase *nă ^{0}jloo tìʔ ní yajan* /na^{0} hlo:$^{0\text{-}X}$ tiʔ^{L} ni^{H} jahã^{X}/ (NEG know essence(.3) what year) 'didn't know which year'. Note that much of the initial portion of the lateral is devoiced in this context, but that frication noise is absent.

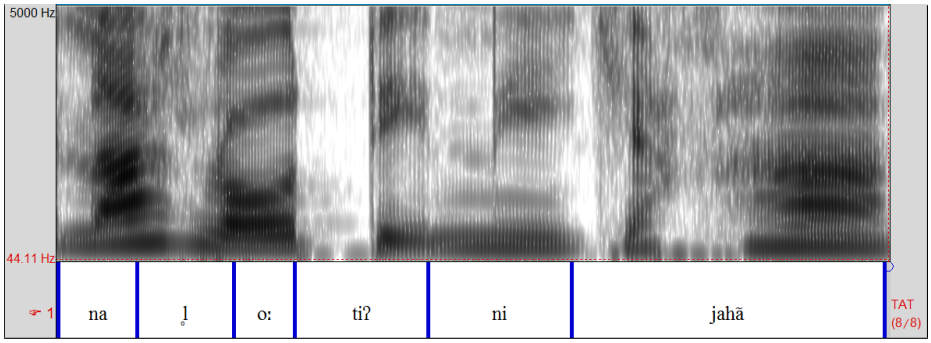


Figure 3.22: Spectrogram of [l̥] in *^{0}jloo tìʔ*

Figure 3.23 shows an example of [ɬ] in the phrase *lkaa su* /lkaː^{X} su^{X}/ (all place) 'everywhere' (the preceding material is from a prior clause). Here the lateral is voiceless between the edge of a word and a voiceless segment, and frication noise can clearly be seen.

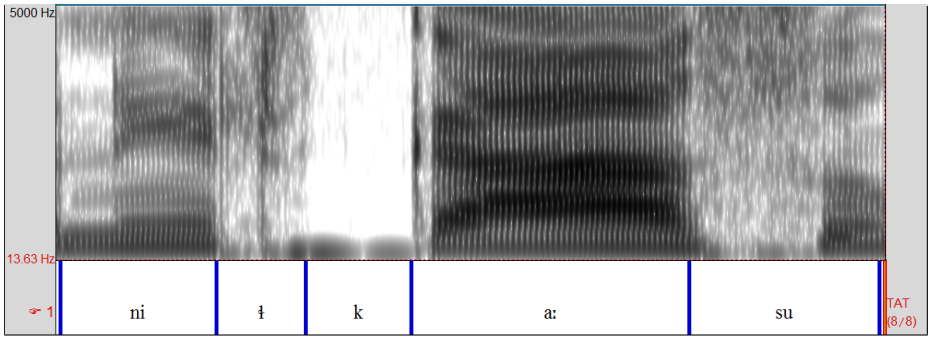


Figure 3.23: Spectrogram of [ɬ] in *lkaa su*

/l/ does not appear before nasal vowels in roots owing to a historic process in which *l > *n in the context of a nasal vowel (E. Campbell, in press; Rasch, 2002). As a post-lexical process, laterals can precede nasal vowels if the nasal vowel is part of the exponent of first-person subject or possessor inflection, as with *tyalán* /tʲalãᴴ/ (angry.1SG) 'I am angry' from the base form *tyalá* /tʲalaᴴ/ 'angry'.

3.3.6.2 Voiced alveopalatal lateral /ɮʲ/

The laminal lateral /ɮʲ/ appears in many roots in Tataltepec Chatino. A voiced alveopalatal lateral made with contact between the tongue blade behind the alveolar ridge [ɮʲ] appears in several contexts: word-initially before vowels (79), intervocalically (80), and in clusters not of the form /hɮʲ/ (81).

(79) Word-initial /ɮʲ/

lyeè	/ɮʲeːᴸ/	[ɮʲeː]	'fierce'
lya	/ɮʲaˣ/	[ɮʲa]	'level'

(80) Medial /lʲ/

⁰talyà	/talʲa$^{0\text{-}L}$/	[tạlʲa]	'night'
nkwalya	/nkʷalʲa^{X}/	[ⁿgʷạlʲa]	'congealed fat'
kalyá	/kalʲa^{H}/	[kạlʲa]	'backstrap loom'
tkilyi	/t-kilʲi^{X}/	[tkilʲi]	'slippery'

(81) /lʲ/ in clusters

slyaʔ	/slʲaʔ^{X}/	[slʲaʔ]	'sheep, cotton'
⁰plyà	/plʲa$^{0\text{-}L}$/	[plʲa]	'font' < Sp. *pila*
xlyaʔwe	/ʃlʲaʔwe^{X}/	[ʃlʲạʔwe]	'luck'
klyuù	/klʲuː^{L}/	[klʲuː]	'big.SG'

After /h/ a voiceless lateral appears [l̥ʲ] (82). This lateral is partially voiced before the following vowel and a more appropriate narrow transcription may be [l̥ʲlʲ].

(82) /lʲ/ appears as voiceless after /h/

jlyá	/hlʲa^{H}/	[(h)l̥ʲa]	'fart'
jlya	/hlʲa^{X}/	[(h)l̥ʲa]	'irrigation'

Rules summarizing the processes affecting the laminal lateral are given in (83).

(83) Rules affecting /lʲ/

/lʲ/	→	[l̥ʲ]	/h__
		[lʲ]	/ elsewhere

Figure 3.24 shows an example of [lʲ] in a spectrogram of the word *cháʔ ⁰xlyà* /t͡ʃaʔ^{H} ʃlʲa$^{0\text{-}L}$/ (language Castille) 'Spanish language'.

/l/ does not appear before nasal vowels in roots owing to a historic process in which *l > *n in the context of a nasal vowel (E. Campbell, in press; Rasch, 2002). As a post-lexical process, laterals can precede nasal vowels if the nasal vowel is part of the exponent of first-person subject or possessor inflection.

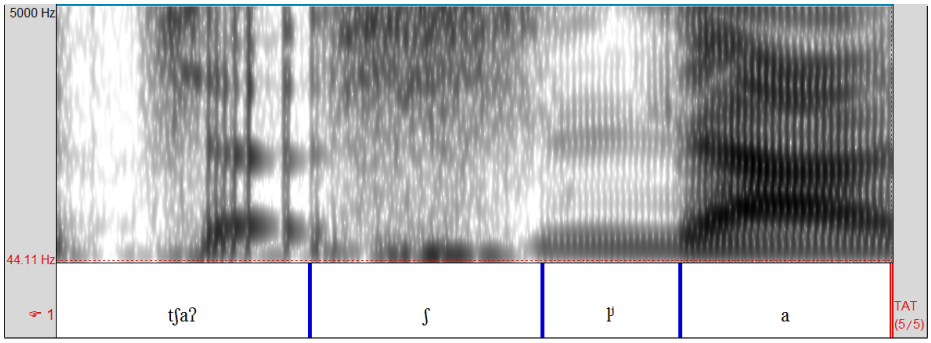


Figure 3.24: Spectrogram of [lʲ] in *cháʔ* ^{0}*xlyà*

3.3.6.3 Voiced alveolar tap /ɾ/

The voiced alveolar tap /ɾ/ appears infrequently in native vocabulary and more frequently in loan vocabulary. The flap occurs in contexts including word-initially before vowels, (84), intervocalicaly (85), and in clusters (86).

(84) Word-initial /ɾ/ before vowels

reè	/ɾeː^{L}/	[ɾeː]	'here, this'
ruwà	/ɾuwa^{L}/	[ɾuwa]	'volume measure' < Sp. *arroba*

(85) Word-medial /ɾ/

tyjo ^{0}perù	/tʲho^{X} peɾu$^{0\text{-}L}$/	[tʲhopeɾu]	'watermelon' < Coastal Mixtec *peru*
^{0}lorò	/loɾo$^{0\text{-}L}$/	[loɾo]	'parrot (sp.)' < Sp. *loro*
karetera	/kaɾetera^{X}/	[kaɾetera]	'road, highway' < Sp. *carretera*
serentte	/seɾentte^{X}/	[seɾente]	'president' < Sp. *presidente*
^{0}starù	/staɾu$^{0\text{-}L}$/	[staɾu]	'soldier' < Sp. *soldado*

(86) /ɾ/ in clusters

kruǔ	/kɾuː^{0}/	[kɾuː]	'dove (*tortolita*)'
kwralya	/kʷɾalʲa^{X}/	[kʷɾa̤lʲa]	'possum'
ya bartzuʔ	/ja^{X} βa̤ɾt͡suʔ^{X}/	[jaβa̤ɾtsuʔ]	'tree species (*guamúchil*)'
fransè	/franse$^{0\text{-}L}$/	[franse]	'gringo' < Sp. *francés*
^{0}mstrù	/mstɾu$^{0\text{-}L}$/	[mstɾu]	'teacher' < Sp. *maestro*

Figure 3.25 shows an example of the tap /ɾ/ in the phrase *loʔó* ^{0}*urù* /loʔo^{H} uɾu$^{0\text{-}L}$/ (with/and donkey) 'and a/the donkey'. ^{0}*Urù* is a fully nativized loan of Sp. *burro*, as can be seen from the deletion of the labial segment before a rounded vowel (§4.3.5).

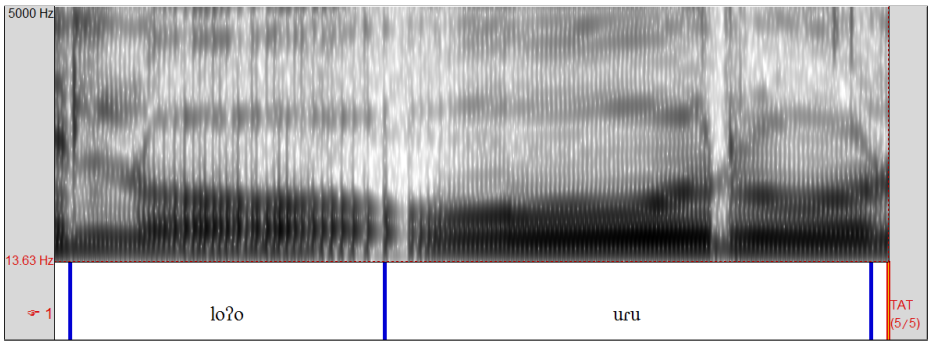


Figure 3.25: Spectrogram of [ɾ] in *loʔó* ^{0}*urù*

In native clusters, /ɾ/ only follows a velar stop /k kʷ/ (*kwralya* /kʷɾalʲa^{X}/ 'possum' and *nkrąjwá* /nkɾahwa^{H}/ 'yay big'). In native vocabulary /ɾ/ only occurs either after /a/ or before /e/. This restricted distribution is partly a historical accident of the origins of the /ɾ/ phoneme which may derive from a historic *nt cluster or the lenition of an intervocalic /t/, and partly a product of the relativly low frequency of /ɾ/ in the lexicon, as the flap occurs in many more consonantal and vocalic contexts in loanwords.

3.3.6.4 Voiced labiovelar glide /w/

Tataltepec Chatino has a labiovelar glide /w/. The labiovelar glide appears as a voiced bilabial approximant [β̞] word-initially before high front vowels (87).

(87) /w/ before /i/ vowels

wiʔyu	/wiʔju^{X}/	[βi̤ʔju]	'two days from now'
wixônʔ	/wiʃõʔ^{0L}/	[βi̤ʃõʔ]	'daughter!'
winaʔá	/winaʔa^{H}/	[βi̤n^{ã}ʔã]	'Virgin of the Assumption'
wiʔyu	/wiʔju^{X}/	[βi̤ʔju]	'three days later'

When /w/ appears word-initially before a (voiceless) obstruent (stops and affricates), it is produced as a voiceless bilabial fricative [ɸ], as in (88). This distribution is not limited to utterance-initial position; utterance-medial productions of a word like /wt͡ʃa^{H}/ 'the day after tomorrow' are realized as [ɸtʃa].

(88) /w/ appears voiceless word-initally before a voiceless segment

wchá	/wt͡ʃa^{H}/	[ɸtʃa]	'day after tomorrow'
wti	/wti^{X}/	[ɸti]	'dry'

When preceded by /h/, /w/ also is produced as the voiceless glide [ʍ], as in the examples in (89). Speakers vary as to whether or not a period of frication is produced before the voiceless glide (which I transcribe as [hʍ]) in this context.

(89) /w/ appears voiceless after /h/

jwaʔǎn	/hwaʔã^{0}/	[(h)ʍ^{ã}ʔã]	'thus'
tajwàʔ	/tahwaʔ^{L}/	[tą(h)ʍaʔ]	'clever'
^{0}jwesè	/hwese$^{0\text{-}L}$/	[(h)ʍese]	'judge'

For many speakers, the production of /hw/ before low vowels occasionally is realized with a voiceless glottal fricative before the voiceless glide [hʍ], as the spectrogram in Figure 3.26 shows the phrase *jwaʔǎn ^{0}ntzuʔu tzajwà* /hwaʔã^{0} ntsuʔu$^{0\text{-}X}$ t͡ʃahwa^{L}/ (thus G.exist(.3) like_that) 'they are like that'.

In all other contexts, including intervocallically (90), and in clusters with segments other than /h/ (91), /w/ appears as the voiced labiovelar glide [w].

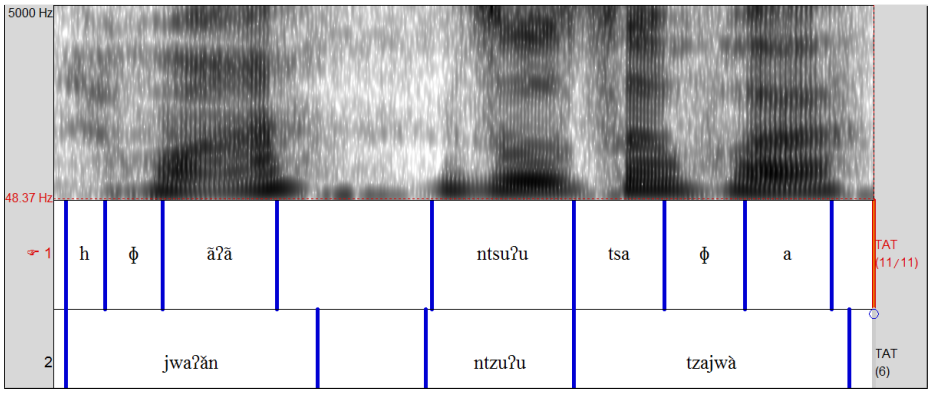


Figure 3.26: Spectrogram of [hʍ] in *jwaʔân ^{0}ntzuʔu tzajwà*

(90) Medial /w/ appears as [w]

tawa	/tawa^{X}/	[t̪awa]	'loud'
tyuwèʔ	/tʲuweʔ^{L}/	[tʲ̪uweʔ]	'edible tuber (*palo de escoba*)'
yuwàʔ	/juwaʔ^{L}/	[juwaʔ]	'rootbeer plant'
xlyuwà	/ʃlʲuwa^{L}/	[ʃlʲ̪uwa]	'chirimoya'

(91) /w/ in clusters

^{0}*laʔwe*	/laʔwe$^{0\text{-}X}$/	[l̪aʔwe]	'black sapote'
swe	/swe^{X}/	[swe]	'small'
lwiì	/lwi:^{L}/	[lwi:]	'clean, neat'
rwe	/ɾwe^{X}/	[ɾwe]	'violin' < ?Sp. *vihuela*

Rules summarizing the processes affecting /w/ are given in (92).

(92) Rules affecting /w/

/w/	→	[β̞]	/ #__i
		[ʍ]	/ h__
		[w]	/ elsewhere
/hw/	→	[ʍ]	(optional)

The absence of /w/ before nasal vowels is due to a historic sound change in which *w > m in roots containing a nasal vowel (E. Campbell, in press). The absence of /w/ before the back vowels /o u õ/ is due to a restriction against [+ labial] CV sequences (§ 4.3.5).

3.3.6.5 Voiced palatal glide /j/

The voiced palatal glide /j/ which contrasts with a voiceless palatal glide /j̥/ which is phonetically a voiceless palatal fricative [ç] but patterns with the other non-nasal sonorants. The voiced palatal glide /j/ appears as [j] in contexts such as word-initially before vowels (93), intervocallically (94), and in clusters not of the form /#__$C_{[-son]}$ (95).

(93) Word-initial /j/

yulù	/julu^{L}/	[julu]	'striped'
yaà	/ja:^{L}/	[ja:]	'cactus'
yaná	/jana^{H}/	[jn̥ɑ̃]	'corncob'

(94) Medial /j/

chiyùʔ	/t͡ʃijuʔ^{L}/	[tʃijuʔ]	'hummingbird'
kayàʔ	/kajaʔ^{L}/	[kn̥jaʔ]	'payment'
kwliyàʔ	/k^{w}lijaʔ^{L}/	[k^{w}lijaʔ]	'rich'
nkwayó	/nk^{w}ajo^{H}/	[ᵑg^{w}n̥jo]	'tarantula'

(95) /j/ in clusters

kyaʔ	/kjaʔ^{X}/	[kjaʔ]	'foot'
^{0}plisya	/plisja$^{0\text{-}X}$/	[plisja]	'police' < Sp. *policía*
kaʔyà	/kaʔja^{L}/	[kn̥ʔja]	'mountain'
^{0}saryù	/saɾju$^{0\text{-}L}$/	[sn̥ɾju]	'rosary' < Sp. *rosario*

Word-initially before an obstruent, there is a neutralization of the voiced and voiceless palatal glides, and only voiceless glides (realized as the fricative [ç]) are observed, as in (96).

(96) /j/ appears as voiceless word-initially before a voiceless segment

ykuʔ	/jkuʔ^{X}/	[n̥kuʔ]	'fist'
ykwàʔ	/jk^{w}aʔ^{L}/	[n̥k^{w}aʔ]	'spring (water)'
ykwá	/jk^{w}a^{H}/	[n̥k^{w}a]	'gruel'

Rules summarizing the processes affecting /j/ are given in (97).

(97) Rules affecting /j/

/j/ → [ç] /#__C$_{[-son]}$
[j] /elsewhere

Figure 3.27 shows an example of [j] in a spectrogram of the phrase *loo yaà* /lo:^{X} ja:^{L}/ (face(.3) prickly_pear) 'on the prickly pear cactus'.

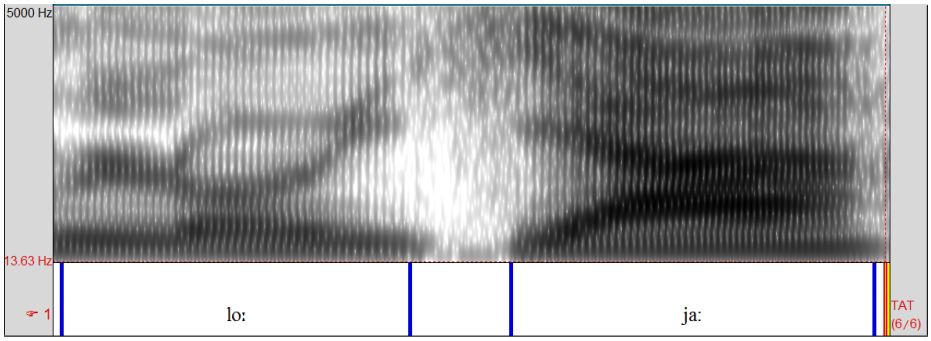


Figure 3.27: Spectrogram of [j] in *loo yaà*

Figure 3.28 shows an example of a voiceless fricative [ç] realization of /j/ word-initially before a stop in a spectrogram of the word *ykwĭʔ* 'the same (person)'.

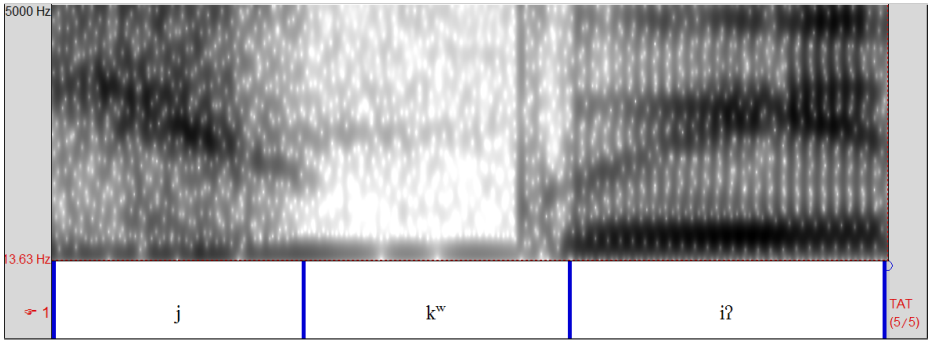


Figure 3.28: Spectrogram of [ç] in *ykwiʔ*

/j/ does not form many clusters in native vocabulary, and only appears in clusters before velar stops /k kʷ/ or after /ʔ/. This is considered a historical accident as /j/ forms clusters with many more consonants in loanwords. The absence of /ji/ and /jĩ/ sequences is due to a restriction on glides followed by similar vowels parallel to the restriction evidenced by the absence of /wo/ and /wu/ sequences (§4.3.4).

3.3.6.6 Voiceless palatal glide /j̥/

The voiceless palatal glide /j̥/ occurs at the beginnings of words (98), word-medially between vowels (99), and in clusters (100). In all contexts, /j̥/ appears as a voiceless palatal fricative [ç].

(98) Word-initial /j̥/

jyakàn	/j̥akã^{L}/	[ç̥akɑ̃]	'ear'
jyoʔó	/j̥oʔo^{H}/	[ç^{o}ʔo]	'deceased'
jyenaá	/j̥ena:^{H}/	[çenɑ̃:]	'last year'

(99) Medial /j̥/

chijyaʔ	/t͡ʃij̥aʔ^{X}/	[tʃiç̥aʔ]	'Mexico'
tyijyuʔ	/tʲij̥uʔ^{X}/	[tʲiç̥uʔ]	'far'

(100) /j̥/ in clusters

ljya	/lj̥a^{X}/	[lç̥a]	'sugarcane'
kwjyà	/kʷj̥a^{L}/	[kʷç̥a]	'game'
tyjyàn	/tʲj̥ã^{L}/	[tʲç̥ɑ̃]	'bone'

This phoneme has a restricted distribution and always follows a current or historic high front vowel. Word-initial /j̥/ may have been originally preceded by a prefix containing a high-front vowel.

3.3.6.7 Voiced bilabial approximant

One rare phoneme present in Tataltepec Chatino is the bilabial approximant /β̬/.[13] In all contexts, this phoneme appears as [β̞], and is neutralized with the develarized allophone of /w/ which is found before front vowels when not after /u/. There are only three instances of apparently native lexemes with /β̬/ in the lexicon: *boʔǒ* /β̬oʔo^{0}/ 'coyote' and *bartzuʔ* /β̬aɾt͡suʔ^{X}/ '*Pithecellobium dulce*' (known in local Spanish as *guamúchil*), and *yabèʔ* /jaβ̬eʔ^{L}/ 'curse'. (101) gives some examples of words with this phoneme.

(101) Lexemes containing /β̬/

boʔǒ	/β̬oʔo^{0}/	[β̬^{o}ʔo]	'coyote'
bartzuʔ	/β̬aɾt͡suʔ^{X}/	[β̬a̤ɾtsuʔ]	'*Pithecellobium dulce*'
yabèʔ	/jaβ̬eʔ^{L}/	[ja̤β̬eʔ]	'curse'
^{0}bata	/β̬ata$^{0\text{-}X}$/	[β̬a̤ta]	'cow' < Sp. *vaca* /ˈbaka/

Other instances of /β̬/ in the lexicon are in recent, only partially-nativized loans from Spanish containing /b/ (which is realized in many contexts as [β]), which receive Chatino prosody (final syllables are stressed no matter which syllable was stressed in the source) but conserve much of the phonology of their sources. One example of these lexemes is *nobena* /noβ̬ena^{X}/ [noβ̬eˈna] 'novena' < Sp. *novena* [noˈβena].

Figure 3.29 shows an example of the bilabial approximant [β̞] in the phrase *Cháʔ n-taá ^{0}yabeʔ ntyusì jiʔìn* /t͡ʃaʔ^{H} n-ta:^{H} jaβ̬eʔ$^{0\text{-}X}$ nt^{j}usi^{L} hiʔĩ^{L}/ (COMP C-give curse God NSUB(.3)) 'because God had given [him] a curse'.

[13] Since the IPA lacks a single symbol for a bilabial approximant, it is symbolized here as a lowered bilabial fricative.

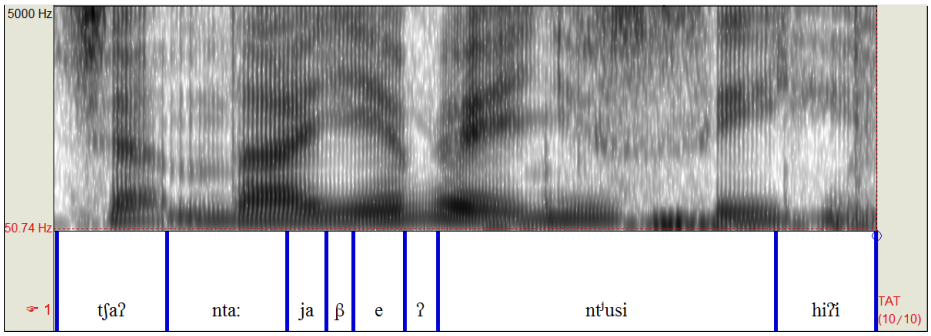


Figure 3.29: Spectrogram of [β] in *cháʔ ntaá yabeʔ ntyusì jiʔìn*

3.4 Vowels

Tataltepec Chatino has a vowel system similar to that of many of the extant Chatino topolects with five vowel qualities[14] and a contrast between oral and nasal vowels. This section will begin with a brief overview of the vocalic system of Tataltepec Chatino, then continue to discuss the phonological contrasts present in the system. Due to the interaction between vowel phonemes and the autosegmental nasal feature (§ 2.3), the five vowel qualities correspond to nine phonemic vowels: five oral and four nasal, each of which will be discussed in turn.

3.4.1 Vowels overview

Tataltepec Chatino features a modest inventory of five vowel qualities with additional contrasts in length and nasalization. Due to the presence or absence of autosegmental features of length and nasality, there are a total of eighteen surface vowel forms. As shown

[14] A few notable exceptions to this generalization are Panixtlahuaca Eastern Chatino which has mid-open vowels /ɛ ɔ/ in addition to mid-close vowels /e o/ (Woodbury & Kingston, 2014), and some Eastern Chatino topolects like that of San José Ixtapan which have a high central allophone of /i/ after coronals (Anthony Woodbury, p.c. 2014).

in Figure 3.30, Tataltepec Chatino has five oral vowel qualities at three levels of height (two high, two mid, one low) and backness (two front, one central, two back). Back vowels are pronounced with lip rounding and non-back vowels are not rounded.

	front	central	back
high	i(:)		u(:)
mid	e(:)		o(:)
low		a(:)	

	front	central	back
high	ĩ(:)		
mid	ẽ(:)		õ(:)
low		ã(:)	

Figure 3.30: Vowels of Tataltepec Chatino

The five oral vowel qualities are roughly those of Spanish, though as shown in Figure 3.31's plot of these vowels in formant space shows, the mid vowels appear higher than would be expected in a language like Spanish. Among the nasal vowels (which only occur in the context of the stem-aligned, leftward-spreading nasalization and a progressive assimilation between onsets and vowels § 2.3), there are four vowels at three levels of height (one high, two mid, one low) and backness (two front, one central, one back). The back nasal vowel, like the back oral vowels, is pronounced with lip rounding.

Figure 3.31 plots the F1 and F2 taken from the midpoint of a number of repetitions of each vowel for a single female speakers. The vowels were all in the stressed syllables of words produced in citation form. Note that the nasalized front vowels /ĩ/ and /ẽ/ are generally produced lower than their oral counterparts /i/ and /e/ whereas the nasalized back vowel /õ/ is generally produced higher than /o/ but lower than /u/. The nasalized low vowel /ã/ is produced further back than its oral counterpart /a/. This lowering of nasal vowels relative to their oral counterparts is consistent with cross-linguistic patterns in which high and mid front nasal vowels are commonly perceived as lower than their oral counterparts and nasal low vowels as raised (Beddor, 1993).

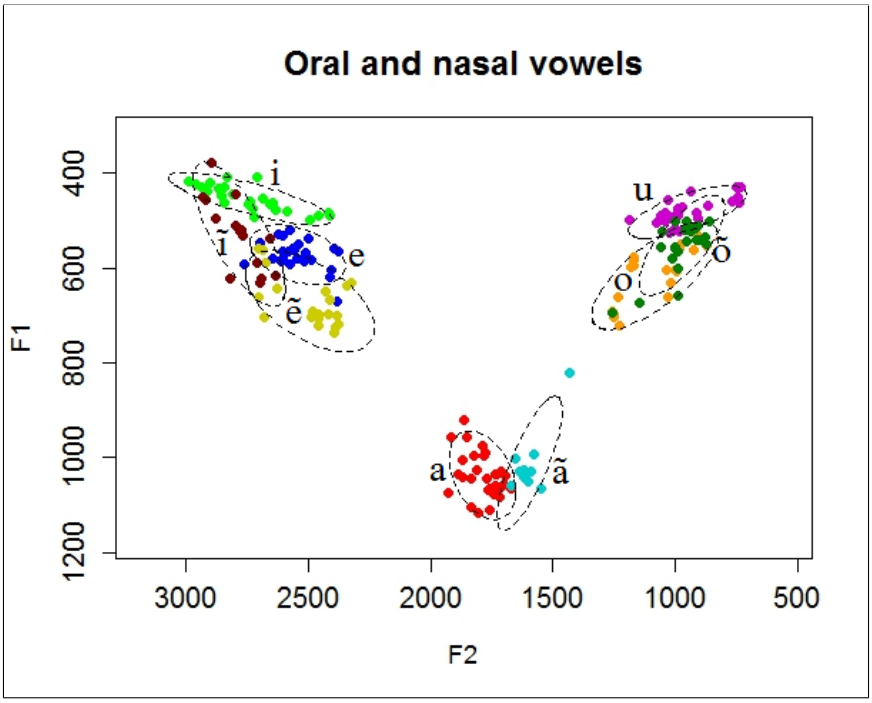


Figure 3.31: Oral and nasal vowels in formant space

	front	back	labial	high	low	nasal
a	-	-	-	-	+	-
ã	-	-	-	-	+	+
e	+	-	-	-	-	-
ẽ	+	-	-	-	-	+
i	+	-	-	+	-	-
ĩ	+	-	-	+	-	+
o	-	+	+	-	-	-
õ	-	+	+	-	-	+
u	-	+	+	+	-	-

Table 3.5: Distinctive features of vowels

The distinctive features of Tataltepec Chatino's vowels are given in Table 3.5, following Halle and Clements (1983). The [labial] feature is entirely redundant with [back] and is included here only to highlight the the rounded nature of the back vowels.

3.4.2 Vowel Contrasts

Tataltepec Chatino's vowels differ in terms of quality (height, backness, and rounding), nasalization, and length. All possible combinations of these contrasts are observed in open syllables, whereas certain nasal vowels are not found in syllables with codas (which can only be /ʔ/ in native vocabulary or /ɾ/ in loans). Specifically, high front nasal vowels are not found with codas (§ 4.2.3).

3.4.2.1 Quality Contrasts

The contrast among the five vowel qualities, nasalization, length create the surface vowel contrasts in Tataltepec Chatino. Given that only one back vowel quality (/õ/) occurs in a nasalized context, there are eighteen surface vowel contrasts possible, all of which

are present in open syllables. In open syllables, all five oral and four nasal qualities are possible as short vowels, as seen in (102) on the left, and as long vowels, as seen in (102) in the right-hand columns.

(102) Short and long vowels in open syllables

kcha	/ktʃa^{X}/	'sick'	*kaá*	/ka:^{H}/	'nine'
kche	/ktʃe^{X}/	'plant fiber'	*kee*	/ke:^{X}/	'rock'
kchi	/ktʃi^{X}/	'grindstone'	*kìì*	/ki:^{L}/	'grass, reed'
kolo	/kolo^{X}/	'turkey'	*koò*	/ko:^{L}/	'cloud'
kù	/ku^{L}/	'already'	*kuú*	/ku:^{H}/	'censer'
skwàn	/sk^{w}ã^{L}/	'dough'	*kwaàn*	/k^{w}ã:^{L}/	'high'
lkwén	/lk^{w}ẽ^{H}/	'image'	*kweén*	/k^{w}ẽ:^{H}/	'straight'
kxin	/kʃĩ^{X}/	'eyelid'	*kiin*	/kĩ:^{X}/	'swelling'
kukòn	/kukõ^{L}/	'pygmy owl'	*koòn*	/kõ:^{L}/	'tuber'

In closed syllables, some of the surface vowel forms are not found. Specifically, the high front nasal vowel /ĩ/ does not appear before the coda consonant /ʔ/.[15] In closed syllables, all five oral vowel qualities and three nasal vowel qualities (/ã ẽ õ/) can appear as short vowels or as long vowels, as in (103). Some of these surface vowels are very uncommon in the language, and two of them, /ã:/ and /õ:/ have been observed with a coda (/ʔ/) only in stems which have been inflected for a first-person possessor or subject (as is the case with *^{0}yaànʔ* /jã:ʔ$^{0\text{-}L}$/ (hand.1SG) 'my hand' and *^{0}nkwtoònʔ* /nk^{w}-tõ:ʔ$^{0\text{-}L}$/ (C-cough.1SG) 'I coughed' (cf. *yaàʔ* /ja:ʔ^{L}/ (hand(.3)) 'hand' and *nkwtuùʔ* /nk^{w}-tu:ʔ^{L}/ (C-cough(.3)) 'coughed'), which has the nasalization of the stem-final vowel as one of its exponents.

[15] It is not clear if this restriction is best ascribed to all coda consonants, or just to /ʔ/, since the only other possible coda consonant, /ɾ/ which is a coda chiefly in loaned words, is only found in the unstressed, non-stem-final syllables where nasal contrasts cannot occur. Thus, it cannot be determined if /ĩ/ cannot appear before all coda consonants, or just the glottal stop.

(103) Short and long vowels in closed syllables

kwaʔ	/k^{w}aʔ^{X}/	'dew'	*jaàʔ*	/ha:ʔ^{L}/	'reed mat'
kwèʔ	/k^{w}eʔ^{L}/	'pig'	*kweèʔ*	/k^{w}e:ʔ^{L}/	'bat'
kchiʔ	/k$\widehat{tʃ}$iʔ^{L}/	'chick'	*kiiʔ*	/ki:ʔ^{X}/	'fire'
nkóʔ	/nkoʔ^{H}/	'foam'	*koòʔ*	/ko:ʔ^{L}/	'moon'
kúʔ	/kuʔ^{H}/	'piece'	*kuùʔ*	/ku:ʔ^{L}/	'filth'
kchànʔ	/k$\widehat{tʃ}$ãʔ^{L}/	'hair'	*^{0}yaànʔ*	/jã:ʔ$^{0\text{-}L}$/	'my hand'
kwténʔ	/k^{w}tẽʔ^{H}/	'spindle'	*teěnʔ*	/tẽ:ʔ^{0}/	'wrinkled'
kwtyonʔ	/k^{w}t^{j}õʔ^{X}/	'pot'	*^{0}nkwtoònʔ*	/nk^{w}-tõ:ʔ$^{0\text{-}L}$/	'I coughed'

3.4.2.2 The Length Contrast

Tataltepec Chatino's vowels feature a length contrast. Long vowels are written in the practical orthography by a doubling of the vowel (i.e. *ke* 'head' versus *kee* 'rock'). Some minimal pairs and near-minimal pairs for length contrasts can be found in (104), where short vowels are found in the left, and long vowels on the right. Short and long vowels are found among all surface contrasts. This feature is discussed more fully in autosegmental terms in § 2.4.

(104) (Near-)minimal pairs involving vowel length

la	/la^{X}/	'more'	*laa*	/la:^{X}/	'church'
kwà	/k^{w}a^{L}/	'broom'	*kwaà*	/k^{w}a:^{L}/	'tomb'
yàʔ	/jaʔ^{L}/	'when'	*yaàʔ*	/ja:ʔ^{L}/	'hand'
ke	/ke^{X}/	'head'	*kee*	/ke:^{X}/	'rock'
ti	/ti^{X}/	'who?'	*tií*	/ti:^{H}/	'ten'
kòn	/kõ^{L}/	'owl'	*koòn*	/kõ:^{L}/	'edible tuber'

Long vowels are only present in stem-final syllables, whereas short vowels occur in stem-final syllables and in non-stem-final syllables. As will be discussed more fully below, this duration contrast is only present in stressed (i.e. stem-final σ_S) syllables of phonological words (§ 2.2.1.1). Unstressed syllables (σ_W) exhibit no vowel length con-

trast, and evidence for the shorter duration of these vowels is provided in the discussion of prosodic effects of Tataltepec Chatino's stem-final stress.

A length contrast is not observed in cases of vowels interrupted by a glottal stop. That is, there are no *VʔVV sequences in the language, and only short vowels are present in VʔV sequences.[16] As seen in (105), all five oral vowels and four nasal vowels can occur in this structure despite the restriction against long vowels. Due to translaryngeal nasal harmony, the nasal feature of the stem-final vowel spreads to the vowel before the glottal stop, as seen in the broad phonetic transcriptions in (105). While this could be seen as evidence that a surface VʔV sequences represent a laryngealized nucleus rather than a VCV sequence, facts surrounding the realizations of tone sequences show that a VʔV should be considered phonological /VCV/ sequences (§ 4.2.2).

(105) Vowels in /VʔV/ sequences

nkaʔà	/nkaʔa^{L}/	[^{ŋ}g^{a}ʔa]	'green'
ncheʔē	/ntʃeʔe$^{H\widehat{L}}$/	[^{n}tʃ^{ɛ}ʔe]	'rooster'
kiʔi	/kiʔi^{X}/	[k^{i}ʔi]	'furrow'
^{0}koʔo	/koʔo$^{0\text{-}X}$/	[k^{o}ʔo]	'P.drink'
^{0}kuʔu	/kuʔu$^{0\text{-}X}$/	[k^{u}ʔu]	'P.exist'
kwaʔàn	/k^{w}aʔã^{L}/	[k^{wã}ʔɑ̃]	'landslide'
kweʔen	/k^{w}eʔẽ^{X}/	[k^{wẽ}ʔɛ̃]	'wind'
kiʔin	/kiʔĩ^{X}/	[k^{ĩ}ʔĩ]	'excrement'
koʔòn	/koʔõ^{L}/	[k^{õ}ʔõ]	'deaf'

It is interesting to note that the vowel duration contrast in Tataltepec Chatino is a conservative feature which is shared with Zenzontepec Chatino and some Eastern Chatino

[16] E. Campbell (2014) reports VʔVV surface sequences in Zenzontepec Chatino for some stems with =V́ clitics, as with *niʔií* (niʔi=V́ house=DIST) 'that house'. Tataltepec Chatino has no vowel-initial clitics, so cliticization is not a source of VʔVV sequences in this language.

topolects such as Zacatepec Eastern Chatino, Nopala Eastern Chatino, and Teotepec Eastern Chatino (McIntosh, 2015; Villard, 2015). Contemporary long vowels are present where long vowels in these topolects have been reconstructed for Proto-Chatino (E. Campbell, 2013a). Other Eastern Chatino topolects such as Quiahije Eastern Chatino have entirely lost this contrast (E. Cruz, 2011), and in others such as Yolotepec Eastern Chatino and Yaitepec Eastern Chatino the presence of a vowel length contrast is unclear, though phonetically long vowels are reported for some monosyllabic lexemes (E. Cruz et al., 2012; Rasch, 2002).

3.4.2.3 The Nasalization Contrast

One of the most notable features of the Chatino languages is the presence of nasalized vowels, which sets them apart from the Zapotec languages which mostly lack this contrast.[17] Tataltepec Chatino, like all other extant Chatino languages features this same phonological contrast between oral and nasal vowels.[18] Nasalization is indicated by a tilde over the vowel in phonemic transcriptions and by a <n> after the vowel (<Vn>) in

[17]While some Zapotec languages (among them the Papabuco languages, the Coatec topolect of Santa María Coatlán, and the Miahuatec topolect of San Bartolomé Loxicha (Beam de Azcona, 2004; Belmar, 1901)) have nasalized vowels, these appear to be the result of particular morphophonological processes and are not cognate with the nasalized vowels found in Chatino. While lacking direct evidence of nasalized vowels, the now-extinct Solteco is unique in Zapotec in showing traces of this Proto-Zapotecan vowel nasalization with its nasal reflexes of pZAPN *l and NC clusters in stems whose Chatino cognates contain nasalized vowels (Peñafiel, 1886; Smith Stark, 1999). See Sullivant (under review) for an argument that Soltec featured nasalized vowels rather than NC nasal-stop sequences.

[18]Only Panixtlahuaca Eastern Chatino would appear to have a different system of vowel nasalization. Woodbury and Kingston (2014) describe two phonological grades of vowel nasalization where the light grade is characterized by the lowering of the velum and the heavy grade by an excrescent velar nasal offglide. The current PAN system is an elaboration of the common nasalization scheme given that both grades of nasalization are reflexes of Proto-Chatino nasalized vowels, and the distinction between the grades is conditioned by tonal context.

the practical orthography to allow room for the diacritic marks which will mark lexical tone. (106) demonstrates the phonological distinction in nasalization.

(106) (Near-)Minimal Pairs involving Nasalization Distinctions

katyá	/katʲa^{H}/	'edible green	*katyán*	/katʲã^{H}/	'hammock'
^{0}tzaa	/t͡sa:$^{0\text{-}X}$/	'P.NB.go'	*tzaan*	/t͡sã:^{X}/	'day'
kche	/kt͡ʃe^{X}/	'plant fiber'	*kchen*	/kt͡ʃẽ^{X}/	'village'
kiì	/ki:^{L}/	'grass, reed'	*kiin*	/kĩ:^{X}/	'swelling'
koò	/ko:^{L}/	'cloud'	*koòn*	/kõ:^{L}/	'edible tuber'
kiʔi	/kiʔi^{X}/	'furrow'	*kiʔin*	/kiʔĩ^{X}/	'dung'
^{0}kwaʔa	/kʷaʔa$^{0\text{-}X}$/	'P.defend'	*kwaʔan*	/kʷaʔã^{X}/	'ravine'
nkaʔà	/nkaʔa^{L}/	'green'	*nkaʔàn*	/nkaʔã^{L}/	'spirit companion'

Only one back nasal vowel quality /õ/ is observed where two back oral vowel qualities exist /o u/. Other Chatino languages (or their orthographies) distinguish between /õ/ and /ũ/, though there is some disagreement between languages and speakers as to the quality of these vowels, as reported by E. Campbell (2014, 90) for Zenzontepec Chatino. This lack of a contrast between back nasal vowels is widespread across the Chatino languages, and the lack of such a contrast may be quite old within the family, as only one non-low back vowel is present in some reconstructions of Proto-Otomangue (Kaufman, 2006; Rensch, 1966), and recent work on the historical development of Central Zapotec suggests that *o but not *u was present in Proto-Zapotec, and instances of modern /u/ are the result of influence from nearby high front vowels (Beam de Azcona et al., in press). Further evidence of the lack of a contrast is the first-person singular inflection of verb and noun stems, which includes a [+nasal] feature as part of its exponent. For example, when *k-aku* (P-eat(.3)) is inflected for a first-person subject, it surfaces as *k-^{0}akòn* (P-eat.1SG) whose final vowel is segmentally identical to that of *kukòn* 'owl', which features an under-

lying nasalized vowel.

In addition to the autosegmental nasalization under discussion here, there is also coarticulatory phonetic nasalization that takes place when an underlyingly oral vowel is adjacent to a nasal segment.

Nasal vowels occur in stem-final syllables or in non-stem-final syllables if the final syllable has a simple laryngeal onset (ṼhṼ, Ṽ?Ṽ). Oral vowels occur in these environments as well, and can occur in non-stem-final syllables, except when separated from a stem-final nasal vowel across a laryngeal consonant (i.e. *nta?an* 'roasting ear' /nta?ã^{X}/ → [^{n}d^{ã}?ã]). This trans-laryngeal vowel harmony (§ 3.2.2) has only a few exceptions in the lexicon: recent Spanish loans like *kwnejon?* [k^{w}nehõ?] 'rabbit' and the native word *yajan* [jahã] ∼ *ijan* [ihã] 'year'. While the former is a loan (< Sp. *conejo*), the latter is a native form whose lack of translaryngeal vowel harmony (both in terms of nasality and quality) is unexplained. One possibility is that *ijan* does not have the form /ihã^{X}/ but /jhã^{X}/, and /j/ is realized as [i] in this context.

Morphologically, nasalization is a property of stems in which an autosegmental [+nasal] feature is linked to stems containing nasalized vowels. The placement of nasalization on an autosegmental tier (discussed more fully in § 2.3) accounts for the distribution of nasal vowels, which is similar to the distribution for the autosegmental feature of length. Rather than represent this autosegmental feature as a superscript (say <^{N}>) or with a tilde alongside the stem, as with of some representations of Tukanoan languages, I have elected to represent these with a nasal vowel symbol to simplify their representation.

3.4.3 Oral vowels

Five oral vowels are found in Tataltepec Chatino /a(:) e(:) i(:) o(:) u(:)/. These can occur as either short or long vowels in closed or open syllables. Short oral vowels, but not long oral vowels, are found in unstressed, non-stem-final syllables, and both long oral vowels and short oral vowels occur in the stressed stem-final syllables. The following subsections will discuss each of these oral vowels in turn.

3.4.3.1 High front unrounded oral vowel /i/

The high front vowel /i/ is found in all vowel contexts, including in final, prominent open (107) and closed syllables (108).

(107) High front /i/ in final open syllables

latì	/lati^{L}/	[l̥ati]	'day before yesterday'
nkkwi	/nk^{w}k^{w}i^{X}/	[$^{n̥}$k^{w}i]	'rotten'
pii	/pi:^{X}/	[pi:]	'hen turkey'

(108) High front /i/ in final closed syllables

kchiʔ	/k$\widetilde{\text{tʃ}}$iʔ^{L}/	[ktʃiʔ]	'chick'
ntykwiʔ	/nt^{j}k^{w}iʔ^{X}/	[^{n}tʃk^{w}iʔ]	'charcoal'
kiiʔ	/ki:ʔ^{X}/	[ki:ʔ]	'fire'

Short, but not long, /i/ are found in non-final syllables (109), including non-final syllables where the /i/ vowel is mirrored across a laryngeal consonant (110).

(109) High front /i/ in non-final syllables

ntyilí	/nt^{j}ili^{H}/	[^{n}d^{j}ili]	'along'
tyinkkòn	/t^{j}inkkõ^{L}/	[t^{j}inkõ]	'horsefly'
tiyaʔ	/tijaʔ^{X}/	[tijaʔ]	'slow'
siʔyú	/siʔju^{H}/	[siʔju]	'tray'

(110) High front /i/ mirrored across laryngeals

^{0}tiʔi	/tiʔi$^{0\text{-}X}$/	[tʲiʔi]	'poor'
lkiʔi	/lkiʔi^{X}/	[ɬkʲiʔi]	'brittle'
xtyiʔi	/ʃtʲʲiʔi^{X}/	[ʃtʲʲiʔi]	'smell'

The vowel /i/ is not observed after the glide /j/, but may precede it, as in lexemes like *kwiyàʔ* /kʷijaʔ^{L}/ 'soap' and *tiyèʔ* /tijeʔ^{L}/ 'sour'. /i/ occurs after and precedes all other consonants, though sequences of /i/ + a plain coronal consonant (/t t͡s s n l ɾ) are infrequent owing to /i/'s historic role in conditioning the palatalization of following coronals, and many of these sequences are found only in loans, such as *^{0}tisyà* /tisja$^{0\text{-}L}$/ 'justice' < Sp. *justicia*.

Rules affecting /i/ and /iː/ are given in (111).

(111) Rules affecting /i/ and /iː/

/i(ː)/	→	ĩ(ː)	/N__
		i	/__ʔi

3.4.3.2 Mid front unrounded oral vowel /e/

The mid front vowel /e/ is found in all vowel contexts, including in final, stressed open (112) and closed syllables (113).

(112) Mid front /e/ in final open syllables

kee	/keː^{X}/	[keː]	'rock'
^{0}laʔwe	/laʔwe$^{0\text{-}X}$/	[lạʔwe]	'black sapote'
^{0}nskee	/nskeː$^{0\text{-}X}$/	[^{n}skeː]	'guava'
lyeè	/lʲeː^{L}/	[lʲeː]	'strong, fierce'

(113) Mid front /e/ in final closed syllables

^{0}cheʔ	/t͡ʃeʔ$^{0\text{-}X}$/	[tʃeʔ]	'brittle'
tykeèʔ	/tʲke:ʔ^{L}/	[tʃke:ʔ]	'long time'
kwxeèʔ	/k^{w}ʃe:ʔ^{L}/	[k$^{w}_{ʷ}$ʃe:ʔ]	'racoon'

Short, but not long, /e/ are found in non-final syllables (114), including non-final syllables where the /e/ vowel is mirrored across a laryngeal consonant (115).

(114) Mid front /e/ in non-final syllables

memèʔ	/memeʔ^{L}/	[memɛ̃ʔ]	'antlion'
jenaá	/hena:^{H}/	[henɑ̃:]	'last year'
kwnejonʔ	/k^{w}nehõʔ^{X}/	[k^{w}nehõʔ]	'rabbit' < Sp. *conejo*

(115) Mid front /e/ mirrored across laryngeals

ncheʔē	/nt͡ʃeʔe$^{H\widehat{L}}$/	[ntʃ^{e}ʔe]	'rooster'
kwleʔé	/k^{w}leʔe^{H}/	[k^{w}l^{e}ʔe]	'half'
tejeʔ	/tehеʔ^{X}/	[tehеʔ]	'salt'
yeʔē	/jeʔe$^{H\widehat{L}}$/	[j^{e}ʔe]	'raw'

/e/ is rare in non-final syllables where its presence cannot be explained by mirroring across a laryngeal consonant. This is partly due to the lowering or raising of penultimate Proto-Chatino *e in harmony with a final vowel *i or *a (E. Campbell, 2013a, 406), though some non-final /e/ are still present in presumably native (but possibly sound symbolic or reduplicative) vocabulary as with *memèʔ* /memeʔ^{L}/ 'antlion'. /e/ occurs after all consonants, though it does not appear before the consonants /p tʲ k k^{w} t͡s t͡ʃ/ which is most likely an effect of the rarity of penultimate /e/.

Rules affecting /e/ and /e:/ are given in (116).

(116) Rules affecting /e/ and /e:/

/e(:)/	→	ẽ(:)	/N__
		^{e}	/__ʔe

3.4.3.3 Low central unrounded oral vowel /a/

The low central vowel /a/ is found in all vowel contexts, including in final, stressed open (117) and closed syllables (118).

(117) Low central /a/ in final open syllables

kiʔnyà	/kiʔnʲa^{L}/	[kiʔnʲa]	'bed'
ntaa	/nta:^{X}/	[^{n}da:]	'bean'
itya	/itʲa^{X}/	[itʲa]	'water'

(118) Low central /a/ in final closed syllables

chàʔ	/t͡ʃaʔ^{L}/	[tʃaʔ]	'because'
jaàʔ	/ha:ʔ^{L}/	[ha:ʔ]	'reed mat'

Short, but not long, /a/ are found in non-final syllables (119), including non-final syllables where the /a/ vowel is mirrored across a laryngeal consonant (120). In non-final syllables that are not mirrored across a laryngeal consonant, /a/ is raised somewhat from its low central position, and is transcribed here as [ạ] to reflect this. This raising of /a/ in unstressed syllables is to be expected given that unstressed vowels tend to be less hyperarticulated in speech, and the low, open target for this vowel would be more likely to be undershot when unstressed (Jong, 1994; Jong & Zawaydeh, 1999), and as such this is not a phonological rule, but rather a consequence of phonetic processes.

(119) Low central /a/ in non-final syllables

laká	/laka^{H}/	[lạka]	'yesterday'
naʔnì	/naʔni^{L}/	[nạʔnĩ]	'animal'
masi	/masi^{X}/	[mạsi]	'although'
lateʔ	/lateʔ^{X}/	[lạteʔ]	'cloth'
katí	/kati^{H}/	[kạti]	'seven'
kaʔyú	/kaʔju^{H}/	[kạʔju]	'five'
katyón	/katʲõ^{H}/	[kátʲõ]	'firearm'

(120) Low central /a/ mirrored across laryngeals

waʔá	/waʔa^{H}/	[w^{a}ʔa]	'tamarind'
nkaʔà	/nkaʔa^{L}/	[^{ŋ}g^{a}ʔa]	'green'
tyaja	/t^{j}aha^{X}/	[t^{j}aha]	'tortilla'

Given /a/'s wide distribution, it is found before and after all consonants in Tataltepec Chatino.

Rules affecting /a/ and /aː/ are given in (121).

(121) Rules affecting /a/ and /aː/

/a(ː)/	→	ã(ː)	/N__
		^{a}	/__ʔa

3.4.3.4 Mid back rounded oral vowel /o/

The mid back rounded vowel /o/ is found in all vowel contexts, including in final, stressed open (122) and closed syllables (123).

(122) Mid back /o/ in final open syllables

tyoo	/t^{j}oː^{X}/	[t^{j}oː]	'rain'
klyoō	/kl^{j}oː$^{H\widehat{L}}$/	[kl^{j}oː]	'first'
^{0}*nkloo*	/nkloː$^{0\text{-}X}$/	[^{ŋ}gloː]	'^{H}.remove'
yoò	/joː^{L}/	[joː]	'meat cooked in an earth oven'

(123) Mid back /o/ in final closed syllables

tyoòʔ	/t^{j}oːʔ^{L}/	[t^{j}oːʔ]	'century plant'
nkóʔ	/nkoʔ^{H}/	[^{ŋ}goʔ]	'foam'
chóʔ	/t͡ʃoʔ^{H}/	[tʃoʔ]	'female'

Short, but not long, /o/ are found in non-final syllables (124), including non-final syllables where the /o/ vowel is mirrored across a laryngeal consonant (125).

(124) Mid-back /o/ in non-final syllables

konòʔ	/konoʔ^{L}/	[konõʔ]	'worm'
kolo	/kolo^{X}/	[kolo]	'turkey'
nxkomā	/nʃkoma$^{H\overline{L}}$/	[^{n}ʃkomã]	'jicama' < Sp. *jícama*
^{0}*martomà*	/martoma$^{0\text{-}L}$/	[martomã]	'steward' < Sp. *mayordomo*

(125) Mid-back /o/ mirrored across laryngeals

joʔò	/hoʔo^{L}/	[h^{o}ʔo]	'deity, holy'
loʔó	/loʔo^{H}/	[l^{o}ʔo]	'with'
jyoʔó	/j̥oʔo^{H}/	[ç^{o}ʔo]	'deceased'
tyojo	/t^{j}̥oho^{X}/	[t^{j}̥oho]	'squash'

Penultimate /o/ is rare when not mirrored across a laryngeal consonant, and many of these cases are sound symbolic, as with *kolo* /kolo^{X}/ 'turkey' which is imitative of a turkey's call and is the basis of the name of this animal in many of the languages of Mesoamerica. The few lexemes with non-mirrored penultimate /o/ that are neither clearly loans nor sound symbolic also have a mid back vowel in the final syllable, as with *konòʔ* /konoʔ^{L}/ 'worm', *ntoloo* /ntolo:^{X}/ 'important', and *tyonòʔ kwatzíʔ* /t^{j}onoʔ^{L} k^{w}a͡tsiʔ^{H}/ 'bushy lippia (*pitiona*)'. This could be seen as an extension of the trans-laryngeal vowel harmony where the intervening consonant may be a non-laryngeal.

/o/ does not precede the consonants /p t t^{j} t͡s t͡ʃ n^{j} w j̥/ most likely owing to its rarity as a penultimate vowel. The labialized velar stop /k^{w}/ never precedes /o/, and /bo/ only occurs in the recent loan *chibo* /t͡ʃiβo̤^{X}/ 'goat' < Sp. *chivo* and in the native term *boʔǒ* /βo̤ʔo^{0}/ 'coyote'.

Rules affecting /o/ and /o:/ are given in (126).

(126) Rules affecting /o/ and /o:/

/o(:)/	→	õ(:)	/N__
		^{o}	/__ʔo

3.4.3.5 High back rounded oral vowel /u/

The high back rounded vowel /u/ is found in all vowel contexts, including in final, stressed open (127) and closed syllables (128).

(127) High back /u/ in final open syllables

kxù	/kʃu^{L}/	[kʃu]	'avocado'
kuú	/ku:^{H}/	[ku:]	'censer'

(128) High back /u/ in final closed syllables

chúʔ	/t͡ʃuʔ^{H}/	[tʃuʔ]	'coati'
tayùʔ	/tajuʔ^{L}/	[tạjuʔ]	'Jocotepec'
kuùʔ	/ku:ʔ^{L}/	[ku:ʔ]	'filth, filthy'
kúʔ	/kuʔ^{H}/	[kuʔ]	'piece'

Short, but not long, /u/ are found in non-final syllables (129), including non-final syllables where the /u/ vowel is mirrored across a laryngeal consonant (130).

(129) High back /u/ in non-final syllables

kukà	/kuka^{L}/	[kuka]	'left'
^{0}lusuʔ pa	/lusuʔ$^{0\text{-}X}$+pa^{X}/	[lusuʔpa]	'magpie'
kukwénʔ	/kuk^{w}ẽʔ^{H}/	[kuk^{w}ɛ̃ʔ]	'armadillo'
kukòn	/kukõ^{L}/	[kukõ]	'owl'
chuniʔī	/t͡ʃuniʔi$^{H\underline{L}}$/	[tʃun^{ĭ}ʔĭ]	'scorpion'
kuʔwí	/kuʔwi^{H}/	[kuʔwi]	'drunk'

(130) High back /u/ mirrored across laryngeals

^{0}ntzuʔu	/nt͡suʔu$^{0\text{-}X}$/	[^{n}ts^{u}ʔu]	'$_{H}$.exist'
^{0}luʔu	/luʔu$^{0\text{-}X}$/	[l^{u}ʔu]	'alive'
tza ntuʔu	/t͡sa^{X} ntuʔu^{X}/	[tsa ^{n}d^{u}ʔu]	'suddenly'

/u/ does not precede the consonants /t^{j} t͡s t͡ʃ n^{j} l^{j} ʃ j̰/, and the palatal coronals it does precede are all in loans as with *^{0}marakuyà* /marakuja$^{0\text{-}L}$/ 'passion fruit' < Sp. *maracuyá*,

or else are multimorphemic terms as in *xuxkwīʔ ⁰ka* /ʃu-ʃkʷiʔ$^{H\tilde{L}}$=ka$^{0\text{-}X}$/ (RED-pure=AFF) 'very pure'. /u/ does not follow the labiovelar consonants /kʷ w/, and only follows /p/ in loans such as *⁰tyampù* /tʲampu$^{0\text{-}L}$/ 'time' < Sp. *tiempo*.

Rules affecting /u/ and /uː/ are given in (131).

(131) Rules affecting /u/ and /uː/

$$/u(:)/ \rightarrow \underset{u}{\tilde{o}(:)} \quad /N\_\_ \;\; /\_\_ʔu$$

3.4.4 Nasal vowels

Four nasal vowel qualities are found in Tataltepec Chatino /ã(ː) ẽ(ː) ĩ(ː) õ(ː)/. The nasalization of these vowels comes from either the presence of an autosegmental [+ nasal] feature (§ 2.3), or the carryover of the nasality of a preceding nasal segment.

Nasal vowels can occur as either short or long vowels in open syllables, and /ã(ː) ẽ(ː) õ(ː)/ can be found in closed syllables as either short or long vowels. Nasal vowels (both short and long) are found in only in stressed, stem-final syllables, except where vowel nasality has spread across a laryngeal consonant to a penultimate vowel, as in *teʔèn* /teʔẽ^{L}/ → [t$^{\tilde{\varepsilon}}$ʔ$\tilde{\varepsilon}$] 'jar'. The following subsections will discuss each of the nasal vowel phonemes in turn.

3.4.4.1 High front unrounded nasal vowel /ĩ/

The high front unrounded nasal vowel /ĩ/ occurs in final open syllables (132). In penultimate syllables /i/ is realized as [ĭ] if mirrored across a laryngeal consonant by a /ĩ/ in the final syllable (133). /ĩ/ does not occur in closed syllables. The high front nasal vowel is

pronounced a bit lower than /i/, and is transcribed [ĭ] to reflect this. Some productions of /ĩ/ are low enough to be acoustically similar to /ẽ/.

(132) High front /ĩ/ in final open syllables

kxin	/kʃĩ^{X}/	[kʃĭ]	'eyelid'
jiín	/hĩː^{H}/	[hĩː]	'music'
kjin	/khĩ^{X}/	[khĭ]	'skin'
kiin	/kĩː^{X}/	[kĩː]	'swelling'

(133) High front /ĩ/ mirrored across laryngeals

tykijin	/tʲkihĩ^{X}/	[tʃkĭhĭ]	'itch'
kiʔin	/kiʔĩ^{X}/	[kˇʔĭ]	'excrement'
jiʔìn	/hiʔĩ^{L}/	[hˇʔĭ]	'NSUBJ(.3)'

/ĩ/ precedes no consonants in Tataltepec Chatino. /ĩ/ does not follow the consonants /p t͡s m n nʲ l lʲ ɾ j w/. Many of these gaps are likely accidental, though the absence of /ĩ/ after nasal segments is due to a neutralization of oral and nasal high front vowels following nasal segments, and the lack of /jĩ/ sequences mirrors the restriction on /ji/ sequences. The lack of /lĩ/ and /lʲĩ/ sequences are due to a restriction on laterals before nasal vowels in roots. Similarly, the absence of /ĩ/ after most glides is likely the effect of a historical change where glides before historic nasal vowels in roots underwent a process of nasalization (i.e. *j > nʲ / __Ṽ).

Rules affecting /ĩ/ and /ĩː/ are given in (134).

(134) Rules affecting /ĩ/ and /ĩː/

/ĩ(ː)/ → ⁱ /__ʔi
ĭ elsewhere

3.4.4.2 Mid front unrounded nasal vowel /ẽ/

The mid front nasal vowel /ẽ/ occurs as a short or a long vowel in final open syllables (135) and closed syllables (136). In penultimate syllables /e/ is realized as [ɛ̃] if mirrored across a laryngeal consonant by an /ẽ/ in the final syllable (137). /ẽ/ is pronounced somewhat lower than than /e/ and is transcribed as [ɛ̃] to reflect this.

(135) Mid front /ẽ/ in final syllables

⁰katèn	/katẽ$^{0\text{-}L}$/	[kạtɛ̃]	'palmetto (sp.)'
klyatén	/kl^{j}atẽ^{H}/	[kl^{j}ạtɛ̃]	'mosquito'
nakwen	/nak^{w}ẽ^{X}/	[nạk^{w}ɛ̃]	'say, said'

(136) Mid front /ẽ/ in final closed syllables

kukwénʔ	/kuk^{w}ẽʔ^{H}/	[kuk^{w}ɛ̃ʔ]	'armadillo'
teěnʔ	/tẽːʔ^{0}/	[tɛ̃ːʔ]	'wrinkled'

(137) Mid front /ẽ/ mirrored across laryngeals

teʔèn	/teʔẽ^{L}/	[t$^{ɛ̃}$ʔɛ̃]	'clay jar'
kweʔen	/k^{w}eʔẽ^{X}/	[k$^{w\tilde{ɛ}}$ʔɛ̃]	'air, wind'
seʔen	/seʔẽ^{X}/	[s$^{ɛ̃}$ʔɛ̃]	'place'
ntykweʔèn	/nt^{j}k^{w}eʔẽ^{L}/	[ntʃk$^{w\tilde{ɛ}}$ʔɛ̃]	'fishhook'

Since /ẽ/ does not occur in closed or non-mirrored penultimate syllables, it precedes no consonants in Tataltepec Chatino. /ẽ/ does not follow the consonants /p k l l^{j} m n n^{j} k w j j̥/.

The absence of /ẽ/ after nasal segments is due to a neutralization of oral and nasal mid front vowels following nasal segments. The lack of /lẽ/ and /l^{j}ẽ/ sequences are due to a restriction on laterals before nasal vowels in roots. Similarly, the absence of /ẽ/ after most glides is likely the effect of a historical change where glides before historic nasal vowels in roots underwent a process of nasalization.

Rules affecting /ẽ/ and /ẽ:/ are given in (138).

(138) Rules affecting /ẽ/ and /ẽ:/

/ẽ(:)/	→	ɛ̃	/__ʔẽ
		ẽ	elsewhere

3.4.4.3 Low central unrounded nasal vowel /ã/

The low central nasal vowel /ã/ occurs as a short or a long vowel in final open syllables (139) and closed syllables (140). In penultimate syllables /a/ is realized as [ã] if mirrored across a laryngeal consonant by a /ã/ in the final syllable (141). The long nasal vowel /ã:/ only occurs in closed syllables in inflected forms like *⁰yaànʔ* /jã:ʔ$^{0\text{-}L}$/ 'hand.1SG', where the uninflected base (*yaàʔ* /ja:ʔ^{L}/ 'hand') has an oral vowel that is nasalized as part of the encoding of its first-person singular possessor or subject. /ã/ is pronounced somewhat further back than /a/, and is transcribed [ɑ̃] to reflect this.

(139) Low central /ã/ in final open syllables

ijan	/ihã^{X}/	[ihɑ̃]	'year'
nkaàn	/nkã:^{L}/	[ᵑgɑ̃:]	'coconut'
katyàn	/katʲã^{L}/	[kạtʲɑ̃]	'bottle'

(140) Low central /ã/ in final closed syllables

stanʔ	/stãʔ^{X}/	[stɑ̃ʔ]	'branch'
⁰yaànʔ	/jã:ʔ$^{0\text{-}L}$/	[jɑ̃ʔ]	'hand.1SG'

(141) Low central /ã/ mirrored across laryngeals

chaʔàn	/t͡ʃaʔãᴸ/	[tʃ$^{\tilde{a}}$ʔɑ̃]	'change'
kwaʔan	/kʷaʔãᴿ/	[kʷ$^{\tilde{a}}$ʔɑ̃]	'ravine'
nkaʔàn	/nkaʔãᴸ/	[ᵑgˠ$^{\tilde{a}}$ʔɑ̃]	'animal spirit companion'

Since /ã/ does not occur in closed or non-mirrored penultimate syllables, it precedes no consonants in Tataltepec Chatino except for non-tautosyllabic /ʔ h/. /ã/ does not follow the consonants /p ʃ l lʲ ɾ w/.

The absence of /ã/ after nasal segments is due to a neutralization of oral and nasal low vowels following nasal segments. The lack of /lã/ and /lʲã/ sequences are due to a restriction on laterals before nasal vowels in roots. Similarly, the absence of /ã/ after most glides is likely the effect of a historical change where glides before historic nasal vowels in roots underwent a process of nasalization. The only glide which occurs before /ã/ is the voiceless glide /j̥/ as in *tyjyàn* /tʲj̥ãᴸ/ 'bone', and the instances of /j/ which are either in clusters with /ʔ/ as in *⁰niʔyan* /niʔjã$^{0\text{-}X}$/ 'like' or are presumed to be old compound due to their CVCV: structure as with *⁰tziyaan* /t͡sijã:$^{0\text{-}X}$/ 'Temascaltepec'.

Rules affecting /ã/ and /ã:/ are given in (142).

(142) Rules affecting /ã/ and /ã:/

/ã(:)/	→	$^{\tilde{a}}$	/__ʔã
		ɑ̃	/elsewhere

3.4.4.4 Mid back rounded oral nasal /õ/

The mid back nasal vowel /õ/ occurs as a short or a long vowel in final open syllables (143) and closed syllables (144). In penultimate syllables /o/ and /u/ are realized as [õ] if mirrored across a laryngeal consonant by a /õ/ in the final syllable (145).

(143) Mid back /õ/ in final open syllables

ksoòn	/ksõːᴸ/	[ksõː]	'feud'
toon	/tõːˣ/	[tõː]	'knot'
joón	/hõːᴴ/	[hõː]	'rope, string'
k-⁰akòn	/k-akõ⁰⁻ᴸ/	[kąkõ]	'P.eat.1SG'

(144) Mid back /õ/ in final closed syllables

nchòn?	/nt͡ʃõʔᴸ/	[ⁿtʃõʔ]	'young corn'
kwxon?	/kʷʃõʔˣ/	[kᵚʃõʔ]	'termite'
⁰nkwtoòn?	/nkʷ-tõːʔ⁰⁻ᴸ/	[ᵑkᵚtõːʔ]	'I coughed'

(145) Mid-back /õ/ mirrored across laryngeals

koʔòn	/koʔõᴸ/	[kᵒʔõ]	'deaf'
soʔon	/soʔõˣ/	[sᵒʔõ]	'hen'

The long nasal vowel /õː/ only occurs in closed syllables in inflected forms like *nkw-⁰toònʔ* /nkʷ-tõːʔ⁰⁻ᴸ/ 'C-cough.1SG', where the uninflected base (*nkwtuùʔ* /nkʷ-tuːʔᴸ/ 'C-cough(.3)') has an oral vowel that is nasalized as part of the encoding of its first-person singular possessor or subject. /õ/ is pronounced somewhat higher than /o/ but lower than /u/.

Since /õ/ does not occur in closed or non-mirrored penultimate syllables, it precedes no consonants in Tataltepec Chatino. /õ/ does not follow the consonants /p kʷ m lʲ w/.

There are no /lõ/ and /lʲõ/ sequences within single roots due to a restriction on laterals before nasal vowels in roots, though multimorphemic lexemes, typically those stems which are inflected for the first person singular, can appear with /lõ/ sequences, as in the term *⁰loʔòn* /loʔõ⁰⁻ᴸ/ 'with.1SG' which is an inflected form of *loʔó* /loʔoᴴ/ 'with, and'.

Rules affecting /õ/ and /õː/ are given in (146).

(146) Rules affecting /õ/ and /õː/

/õ(ː)/	→	ᵒ	/__ʔõ
		õ	elsewhere

Chapter 4

The Syllable

The syllable of Tataltepec Chatino consists almost always of an onset (which may be complex), a nucleus and an optional coda. Each phonological word in Tataltepec Chatino has one stressed syllable and between zero and two unstressed syllables. This chapter will discuss the syllable and how syllables can be joined up to make phonological words. The types of syllabic nuclei (§ 4.1.2), onsets (§ 4.2.1), and codas (§ 4.2.2) permissible in each kind of syllable will be presented. This chapter will conclude with a discussion of some of the phonotactics of Tataltepec Chatino (§ 4.2) and the co-occurrence restrictions that can be observed (§ 4.3).

4.1 Syllable Shapes

As schematized in (1), the Tataltepec Chatino syllable can consist solely of a vowel, though nearly all syllables have onsets. Any syllable may have a coda, either /ʔ/ or /ɾ/, and may have an onset or be onsetless. The greatest amount of variation in syllable shapes concerns the types of onset clusters that are possible. Any onset can be preceded by a nasal adjunct /m n/. The singleton onsets C_1 and the two-consonant onsets C_2C_1 are fairly unrestricted in the lexicon and are present in the schema in (1) as $(C_2)C_1$. If an onset has three consonants (not counting an optional nasal adjunct), the number of consonants which

fill each slot is heavily restricted. In $C_3C_2C_1$ onsets, the consonant closest to the vowel, C_1, is either a stop {t k}, a glide {w} or a laminal sonorant {l^j n^j}, C_2 is always a fricative {s ʃ h}, and C_3 is a stop {t k k^w}.

(1) $$\left(\left(\begin{Bmatrix} m \\ n \end{Bmatrix} \right) \left\{ \begin{Bmatrix} t \\ k \\ k^w \end{Bmatrix} \begin{Bmatrix} s \\ ʃ \\ h \end{Bmatrix} \begin{Bmatrix} t \\ k \\ l^j \\ n^j \\ w \end{Bmatrix} \right\} \right) V \left(\begin{Bmatrix} ʔ \\ ɾ \end{Bmatrix} \right)$$

$$(C_2)\ C_1$$

When a word is composed of more than one syllable, each syllable can approach the maximal shape presented in (1), though for historical reasons, such a word has not been identified.

Table 4.1 gives examples of each type of syllable shape found in the language.

4.1.1 A note on large clusters

As just mentioned, a number of syllables have large clusters, either CCC clusters like *kwxlyaʔ* /k^wʃ^{j}aʔ^X/ 'sheep' or NCCC clusters like ^{0}*mstrù* /mstɾu$^{0\text{-}L}$/ 'teacher'. The syllable inventory could be reduced if the consonant clusters involved could be shown to not be tautosyllabic.

An attempt to do just this is visible in the earliest analyses of Yaitepec Eastern Chatino based on unpublished data collected by Billy Upson (Gleason, 1959; Kenstowicz & Kisseberth, 1972), which treated some surface consonant clusters as underlying series of consonants separated by voiceless vowels. That is, $C_3C_2C_1V$ could be reanalyzed as C_3C_2u̥C_1V or C_3u̥C_2C_1V. This analysis is not supported by available comparative evidence. For ex-

V(C)	*ĭn*	/ĩ^{0}/	[ĩ]	'AFF'
	itya	/iᵗʲa^{X}/	[i.tʲa]	'water'
	^{0}ornò	/oɾno$^{0\text{-}L}$/	[oɾ.nõ]	'oven'
CV(C)	*^{0}jaʔwa*	/haʔwa$^{0\text{-}X}$/	[hạʔ.wa]	'banana'
	jaàʔ	/ha:ʔ^{L}/	[ha:ʔ]	'reed mat'
	bartzuʔ	/βa̱rt͡suʔ^{X}/	[βa̱r.tsuʔ]	'*Pithecellobium dulce*'
NCV(C)	*ntuu*	/ntu:^{X}/	[^{n}du:]	'liver'
	nkatén	/nkatẽ^{H}/	[^{ŋ}gạ.tẽ]	'white'
	konòʔ nantzen	/konoʔ^{L} nant͡sẽ^{X}/	[ko.nõʔ.nạ.ntsẽ]	'leech'
CCV(C)	*tykwiín*	/tʲkʷĩ:^{H}/	[tʃkʷĩ:]	'road'
	ktyonʔ	/kᵗʲõʔ^{X}/	[kᵗʲõʔ]	'pot'
	slyaʔ	/slʲaʔ^{X}/	[slʲaʔ]	'bile'
NCCV(C)	*ntykwàʔ*	/nᵗʲkʷaʔ^{L}/	[^{n}tʃkʷaʔ]	'fishhook'
	ntwiì	/ntwi:^{L}/	[^{n}dwi:]	'shiny'
	tyinkkúʔ	/tʲinkkuʔ^{H}/	[tʲi.ŋkuʔ]	'skinny'
CCCV(C)	*kwslyaʔ*	/kʷslʲaʔ^{X}/	[kʷslʲaʔ]	'sheep'
	kwxlyaʔ	/kʷʃlʲaʔ^{X}/	[kʷʃlʲaʔ]	'badger'
	^{0}kjwi	/k-hwi$^{0\text{-}X}$/	[khʍi]	'P-kill'
NCCCV(C)	*nkwjnyiʔ*	/nkʷ-hnʲiʔ^{X}/	[^{ŋ}kʷhnʲĩʔ]	'C-borrow'
	nkwskánʔ	/nkʷ-skãʔ^{H}/	[^{ŋ}kʷskãʔ]	'C-TR.tie_up'
	^{0}ntjwiʔ	/nt-hwiʔ$^{0\text{-}X}$/	[^{n}thʍiʔ]	'H-sell'

Table 4.1: Examples of syllable shapes

ample, *kwslyaʔ* 'sheep' must derive from a a Pre-Tataltepec form like *kwi-slyaʔ or *kwi-silaʔ (ANIM-cotton),[1] and never had a /u/ vowel present to undergo devoicing between voiceless stops.

Another possible analysis could be treating at least one of the consonants in the putative cluster as syllabic, as K. Pride and Pride (1970) have analyzed for Tataltepec Chatino. This analysis would require the presence of a number of cross-linguistically rare syllabic

[1]Since sheep are an introduced species, the common Chatino expression of an animacy prefix and 'cotton' cannot be reconstructed for Proto-Chatino.

obstruents, and is not supported by even casual inspection of these clusters. Furthermore, these syllabic segments would fail one of the main tests of syllabicity in that they are irrelevant for the assignment of tones to words.

Still another analysis would be an analysis in which at least some of the consonants in these NCCC onset clusters are not part of any syllable, as with Bella Coola (Bagemihl, 1991). Under an analysis like this, only some consonants (say only C_2C_1 clusters or perhaps only C_1) would be part of the onset of a syllable while others will remain unsyllabified. Such an analysis is motivated for these languages through productive processes of reduplication which are sensitive to syllable structure.[2] The only reduplication pattern in Tataltepec Chatino observes a different pattern, and is limited enough that it is difficult to draw many conclusions from. Additional research may find evidence to support an analysis of Tataltepec Chatino as a language with relatively simple syllable structure that permits a larger set of unsyllabified consonants. In the mean time, Tataltepec Chatino is considered to be a language which places all segments into syllables.

As mentioned above, the variation between words with (N)CCCV(C) syllables and words with simpler structures might suggest that these syllables are in some sense too large and sub-optimal for speakers who modify these syllables to delete some of the offending consonants. A *m-* allomorph of COMPL *nkw-* has been created for some speakers. This allomorph only occurs for some speakers when the *nkw-* /nk^{w}-/ prefix appears on a verb stem beginning with /sC/ or /ʃC/, reducing a NCCC cluster to a NCC cluster, as

[2]For example, in one reduplication process in Bella Coola, only the onset consonant nearest the vowel is reduplicated, suggesting that only this consonant is part of the syllable. E.g. *ck^{w}ał* 'heavy-feet, walking' → *ck^{w}ał-k^{w}ał* 'to walk heavily' not **ck^{w}ał-ck^{w}ał* (Bagemihl, 1991, 613).

when some speakers realize *nkw-s-kán?* [ⁿkʷskã?] (C-TR-untie(.3)) 's/he untied (it)' as *m-s-kán?* [ᵐskã?]. It is interesting to note that the COMPL prefix in the Eastern Chatino of Yaitepec, Teotepec, and Nopala is often *m-* (written <nw-> by Rasch (2002)).

4.1.2 Syllable nuclei

In contrast to the many shapes possible for onset clusters, syllable nuclei are relatively simple in that they consist only of a single vowel, albeit a vowel which can exhibit autosegmental features such as length and nasality in addition to quality distinctions (§ 3.4.2), to say nothing of lexical tone (§ 5.1). Diphthongs and vowel hiatus are entirely absent from native vocabulary. Where adjacent vowels are present in the sources of borrowed words, a glide is inserted between the vowels or a vowel sequence is coalesced into a single vowel in Tataltepec Chatino, as the names *⁰Mariyà* /maɾija$^{0\text{-}L}$/ 'María' and *⁰Rajwè* /ɾahwe$^{0\text{-}L}$/ 'Rafael'.

Only a pair of loans have vowel sequences in Tataltepec Chatino: *⁰snyaù* /snʲau$^{0\text{-}L}$/ 'Santiago' (which also appears in *koò? ⁰snyaù* (moon Santiago) 'July') and *santau* /santau^{X}/ 'money, coin' < Sp. *centavo* 'cent'. Both of these are nativized loans. These correspond to /adu agu/ sequences in Spanish in which the voiced obstruent would undergo lenition, resulting in a fricative consonant [ð ɣ] or ∅.

4.2 Phonotactics

In Table 4.2, on the left we can see several of the syllable shapes found in monosyllabic words with short vowels, and on the right there are the syllable shapes found in monosyllabic words with long vowels. There are also no extant examples of NCV syllables,

which is presumed to be an accidental gap given the relative rarity of short monosyllabic words. There are also no cases of onsetless monosyllabic words, apart from the affective particle *ĭn*.

Short monosyllables			Long monosyllables		
V	/ĩ^{0}/	'AFF'	V:	---	---
VC	---	---	V:C	---	---
CV	/ke^{X}/	'head'	CV:	/ki:^{L}/	'grass'
CVC	/t͡ʃaʔ^{H}/	'word'	CV:C	/ko:ʔ^{L}/	'moon'
CCV	/tʲku^{H}/	'well'	CCV:	/klʲu:^{L}/	'big.SG'
CCVC	/tʲkuʔ^{X}/	'musty'	CCV:C	/klʲa:ʔ^{L}/	'bitter'
NCV	---	---	NCV:	/nte:^{L}/	'here'
NCVC	/nkoʔ^{H}/	'foam'	NCV:C	/ntʲa:ʔ^{L}/	'was made'
NCCV	/nkʷla^{X}/	'mature'	NCCV:	/nsmi:$^{0\text{-}X}$/	'citrus'
NCCVC	/nkʷluʔ^{L}/	'ball'	NCCV:C	/nkʷ-tu:ʔ^{L}/	'coughed'
CCCV	/k-hwi$^{0\text{-}X}$/	'P-kill'	CCCV:	---	---
CCCVC	/kʷʃʲaʔ/	'badger'	CCCV:C	---	---
NCCCV	/nkʷ-hlʲa$^{0\text{-}X}$/	'C-burl_cotton'	NCCCV:	/nkʷ-snʲi:^{X}/	C-grab'
NCCCVC	/nkʷ-hnʲiʔ^{X}/	C-borrow'	NCCCV:C	/nk-ʃ-wi:ʔ$^{0\text{-}L}$/	'C-CAUS-go_out'

Table 4.2: Examples of syllable shapes in monosyllabic words

Table 4.3 shows the syllable shapes found in disyllabic words. There are a very few onsetless disyllabic words in native vocabulary, such as *ijan* /ihã^{X}/ year, *itya* /itʲa^{X}/ 'water', and *ike* /ike^{X}/ 'head'.[3] Either syllable of a disyllabic word may be closed with a coda consonant, of which only two, /ʔ ɾ/, are possible in Tataltepec Chatino, and only /ʔ/ is possible in native vocabulary, with /ɾ/ occurring most often as a word-internal rather than a word-final coda. Only one root *bartzuʔ* /βa̱rt͡suʔ^{X}/ 'Pithecellobium dulce' contains two

[3]Interestingly, all of these words have common variants which do not have onsetless syllables: /ihã^{X}/ ∼ /jahã^{X}/, /itʲa^{X}/ ∼ /tʲa^{X}/, and /ike^{X}/ ∼ /ke^{X}/ and /skʷaʔ^{X}+ke^{X}/. E. Campbell (2014, 152) also reports variation in the production of phonemically onsetless syllables in Zenzontepec Chatino: [ikʲe] ∼ [jikʲe] ∼ [ʔikʲe] ∼ [hikʲe] 'head'.

closed syllables. This is due to the near-absence of /ɾ/ from native roots (and its apparent origin in /nt/ clusters, which are unlikley codas), and a historic limitation of one glottal stop per word (§ 4.3.1). Either or both syllables may have a complex onset containing up to three consonants, to which a nasal adjunct may be added.

V.CV	/ihã^{X}/	'year'
V.CVC	---	---
CV.CV	/jaka^{X}/	'tree'
CV.CVC	/kuk^{w}ẽʔ^{H}/	'armadillo'
CVC.CV	/kaʔja^{L}/	'mountain'
CVC.CVC	/βa̪ɾ͡tsuʔ^{X}/	'Pithecellobium dulce'
CCV.CV	/kliʃẽ^{H}/	'Yaitepec'
CCV.CVC	/k^{w}lakaʔ^{H}/	'twin'
CCVC.CV	/ʃl^{j}aʔwe^{X}/	'luck'
CCVC.CVC	---	---
NCV.CV	/ntana^{X}/	'soot'
NCV.CVC	/nk^{w}ijuʔ^{X}/	'spider'
NCVC.CV	/ntoʔni$^{0\text{-}X}$/	'does'
NCVC.CVC	---	---
NCCV.CV	/nk^{w}lalu^{L}/	'tadpole'
NCCV.CVC	/nkliʃẽʔ^{L}/	'roofing slat'

Table 4.3: Examples of syllable structures on disyllabic words

Table 4.3 only lists disyllabic syllable structures for words with relatively simple medial clusters. More complex medial clusters involve complex onsets of final syllables, such as in *kanttàʔ* /ka.nttaʔ^{L}/ 'threadbare', *^{0}kanttù* /ka.nttu$^{0\text{-}L}$/ 'stew' (< Sp. *caldo*), *kaʔyà ^{0}sintyàʔ* /kaʔ.ja^{L} si.nt^{j}aʔ$^{0\text{-}L}$/ 'Cerro de los Borbones', and *kwlyà ^{0}ntten* /k^{w}l^{j}a^{L} nttẽ$^{0\text{-}X}$/ 'lark'.

	p	t	tʲ	k	kʷ	t͡s	t͡ʃ	s	ʃ	h
p			mptʲ	mpk						
t		ntt		tk	tkʷ					(n)th
tʲ			ntʲtʲ	(n)tʲk	(n)tʲkʷ					(n)tʲh
k			(n)ktʲ	nkk		nkt͡s	(n)kt͡ʃ	ks	kʃ	(n)kh
kʷ		(n)tkʷ	kʷt		nkʷkʷ	(n)kʷt͡s	(n)kʷt͡ʃ	(n)kʷs	(n)kʷʃ	kʷh
t͡s										
t͡ʃ				t͡ʃk						
s	sp	st	stʲ	(m n)sk	(n)skʷ					
ʃ	ʃp	ʃt	ʃtʲ	(m n)ʃk	(n)ʃkʷ					
h										
l		lt	ltʲ	lk	lkʷ	lt͡s	lt͡ʃ	ls		lh
lʲ										
j										
j̊										
w			wtʲ				wt͡ʃ			
ɾ										

	l	lʲ	j	j̊	w	ɾ	m	n	nʲ
p	(m)pl	plʲ				pɾ			
t				(n)tj̊		tɾ	tm		
tʲ				tʲj̊	tʲw				
k	(n)kl	(n)klʲ	(n)kj			(n)kɾ		kn	knʲ
kʷ	(n)kʷl	kʷlʲ		kʷj̊		kʷɾ		kʷn	kʷnʲ
t͡s					t͡sw				
t͡ʃ									
s	sl	slʲ	sj		sw		(n)sm	sn	snʲ
ʃ	ʃl	ʃlʲ	ʃj		ʃw			ʃn	ʃnʲ
h	hl	hlʲ				hɾ		hn	
l				lj̊	lw				
lʲ									
j									
j̊									
w	wl		wj						
ɾ		ɾs	ɾj						

Table 4.4: Attested (N)C_2C_1 onset clusters

4.2.1 Onset Clusters

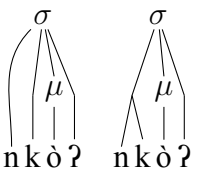
As mentioned above, syllable onsets can be quite complex in Tataltepec Chatino. The attested CC onset consonant clusters of Tataltepec Chatino are presented in Table 4.4. Some phonemes (i.e. /f/) are not found in clusters and others (i.e. /β̞/) only occur next to other consonants if preceded by a heterosyllabic /ʔ/. Since these are not onsets according to this analysis, they are left off of Table 4.4. The Table lists the (N)C_2C_1 onset clusters according to C_2 on the y-axis and C_1 along the x-axis. If the C_2C_1 cluster is preceded by a nasal adjunct (either /m/ or /n/) this segment is also listed in the chart. Parentheses around a nasal symbol indicate that a particular C_2C_1 occurs both with and without a preceding nasal. For space considerations, if both /m/ and /n/ can precede a given C_2C_1 cluster, then the nasal symbols are stacked atop one another. Cells containing C_2C_1 clusters that are only attested in loan vocabulary are shaded gray.

4.2.1.1 Nasal adjuncts

Given that the syllable-initial nasal segments appear to not contribute to the number of consonants when determining if a consonant cluster is too big, and in many cases result in sequences that violate the Sonority Sequencing Principle, it is possible to consider the nasal (which more often than not is word-initial) as an adjunct to the syllable rather than forming clusters with following consonants, mirroring analyses of English's /sC/ clusters. These two different analyses are contrasted in their treatment of *nkòʔ* 'heron' in (2). Under an adjunct analysis an initial nasal is linked to the syllable, whereas other analyses treat the nasal as part of a complex onset of the syllable.

nkòʔ 'heron'

(2)



This work will refer to these nasals as adjuncts since doing so simplifies discussions of possible consonant cluster shapes. Additional investigation is needed to identify whether or not these NC clusters differ in other dimensions from other CC clusters in Tataltepec Chatino.

4.2.1.1.1 Nasal-Stop clusters Stops may also be preceded by a nasal adjunct, forming a NC cluster. (3) provides as example of each such cluster found in the corpus.

(3) Nasal-Stop clusters in TAT

N	C_1	Example	Phonemic	Gloss
m	p	*mpaà*	/mpa:^{L}/	'co-father'
m	t͡ʃ	*mcheèn*	/^{m}t͡ʃẽ:^{L}/	'monkey'
n	t	*ntaa*	/nta:^{X}/	'bean'
n	tʲ	*ntyuʔwé*	/ntʲuʔwe^{H}/	'piece'
n	t͡s	*ntzeènʔ*	/nt͡sẽ:ʔ^{L}/	'Pacific sleeper'
n	t͡ʃ	*nchuʔ*	/^{n}t͡ʃuʔ^{X}/	'pineapple'
n	k	*nkaàn*	/nkã:^{L}/	'coconut'
n	k^{w}	*nkwayó*	/nk^{w}ajo^{H}/	'tarantula'

Due to the relative rarity of labial nasals, only a few such nasal-stop clusters are observed, one of which, *mpaà* 'co-father' is either a loan directly from Spanish (< *compadre*), or indirectly from a neighboring language, and the other, *mcheèn* 'monkey', may possibly

be a loan itself.[4]

4.2.1.1.2 Nasal-Fricative clusters Nasal segments may also precede fricatives in CC clusters. (4) gives one example of each such cluster in the corpus.

(4) Nasal-Fricative clusters in TAT

N	C_1	Example	Phonemic	Gloss
m	s	*⁰msanà*	/msana$^{0\text{-}L}$/	'apple'
m	ʃ	*⁰mxà*	/mʃa$^{0\text{-}L}$/	'mass'
n	s	*nsatyá*	/nsatʲa^{H}/	'helmeted iguana'
n	ʃ	*⁰nxiʔyà*	/nʃiʔja$^{0\text{-}L}$/	'H.scream'

The laryngeal fricative does not form any clusters with nasals. Again, this could be partially explained by the relatively small number of nasal+fricative clusters in the language, and the Proto-Zapotecan stop ancestry of Proto-Chatino's *h may have caused it to have a different distribution than the coronal fricatives.

There are no palatalized nasals in the clusters in (3) and (4) because these nasals in native words ultimately derive from a historic *n-* or *m-* prefix at an earlier stage of the language in which palatalized nasals would not have existed as separate phonemes. With the exception of /m/ preceding non-labial consonants (the only non-homorganic NC clusters in the language), these forms could be represented more abstractly as /N/.

The largest clusters commonly found in the lexicon are the tri-consonantal NCC clusters. A tri-consonantal onset must begin with a nasal sound, and are frequent in the lex-

[4]Hunn (2008) gives two lexemes for 'monkey' in the Zapotec of San Juan Gbëë (Mixtepec) *mĭcw* /mik^{w}/, which is clearly derived from Spanish *mico*, and *màchîn* /matʃin/, which he analyzes as a class term for 'animal' followed by 'China'. Whether this is a genuine etymology or not, it no doubt shares its origin with Tataltepec Chatino's *mcheèn*.

icon due to the fossilization of nasal accretions[5]) or synchronic processes (*n-* is part of all aspect prefixes save those for the potential aspect). Many of the consonant sequences of attested CC clusters (§ 4.2.1.2) are also found in NCC clusters. The few cases where an NCC cluster contains a sequence not found in a CC cluster either feature uncommon phonemes and are likely accidental gaps (*mptyàn?* 'earwig', *^{0}mpkeè*, 'Miguel', *xlyuwà nktzú*, 'Anona (sp.) *islama*') or are cases where the two identical consonants are preceded by a nasal, resulting in a long closure and voiceless production (§ 3.3.2.2).

The first segment of an NCC cluster is a nasal segment (either labial or non-labial), the second may be either a stop, affricate, or fricative (except for /h/), and the third may be stop, affricate, fricative, liquid, nasal or glide.

A few lexemes show NCC clusters whose second element is a fricative and whose third element is not a stop. These include the Nasal-Fricative-Nasal cluster found only in inflected verbs (e.g. *nxnyii* /n-ʃnʲiːˣ/ 'G-grab') and the lexeme *^{0}nsmii* 'citrus' which is composed of the root /smiː$^{0\text{-}X}$/ 'citrus' plus a nasal accretion that may be related to a historic animacy prefix. The other kind of uncommon NCC cluster is the Nasal-Fricative-Glide cluster, which only exists in loan vocabulary, as in the word *krensya* /kɾensjaˣ/ 'belief, tradition' < Sp. *creencia* 'belief'.

[5]See E. Campbell (2013a, 409) for a brief discussion of nasal accretions throughout the Chatino languages. Elsewhere in the Zapotecan branch, nasal accretions (*m-* prefixes) on animal names is a diagnostic trait of the Southern Zapotec languages (Smith Stark, 2007), and *n-* accretions on TAM prefixes is feature of the Macrocoatecan and Miahuatecan subgroups of this branch of Zapotec (Beam de Azcona, 2014).

4.2.1.2 (N)CC clusters

Onsets of two consonants to which a nasal adjunct may be added are frequent and common in the lexicon of Tataltepec Chatino. Clusters may consist of a pair of obstruents, one of which may be a fricative (e.g. /kt͡ʃ tk kʃ st/) as in (5), may be a nasal and an obstruent (/kn sn/) as in (3), an obstruent and a liquid (e.g. /kl lk pɾ ʃlʲ/) as in (18), an obstruent and a glide (/kj tʲw wt͡ʃ/) as in (18), or a liquid and a glide (/wl lw/) as in (22). (5)-(22) show the attested (N)C_2C_1 clusters, provide an example of a lexeme containing the cluster, as well as a phonetic transcription showing the surface realization of the underlying cluster. In all of these examples, a consonant cluster not found in native vocabulary is shaded.

4.2.1.2.1 Stop-Stop Cluster C_2C_1 clusters may contain two stops (understood to include stops and affricates). An example of all such stop-stop clusters in the lexicon is given in (5).

(5) Stop-Stop clusters

C_2	C_1	Example	Phonemic	Gloss
t	k	*tkúʔ*	/tkuʔ^{H}/	'crustacean (sp) *mulita*'
t	k^{w}	*tkwàn*	/tk^{w}ã^{L}/	'basket'
t^{j}	k	*tykaʔà*	/t͡ʃkaʔa^{L}/	'highland Mixtec'
t^{j}	k^{w}	*tykwán*	/t͡ʃk^{w}ã^{H}/	'metal'
t͡ʃ	k	*chka*	/t͡ʃka^{X}/	'another'
k	t^{j}	*ktyì*	/kt^{j}i^{L}/	'paper'
k	t͡ʃ	*kchi*	/kt͡ʃi^{X}/	'grindstone'
k^{w}	t	*kwténʔ*	/k^{w}tẽʔ^{H}/	'spindle'
k^{w}	t^{j}	*kwtyeèʔ*	/k^{w}t^{j}eːʔ^{L}/	'ant'
k^{w}	t͡s	*kwtzéʔ*	/k^{w}t͡seʔ^{H}/	'dysentery'
k^{w}	t͡ʃ	*kwchí*	/k^{w}t͡ʃi^{H}/	'tiger'

Sequences of two coronal or labial stops are not attested in without a nasal adjunct, and are only ever part of an NCC clusters (§ 3.3.2.2). The lack of /kt/ sequences is likely a historical accident, given that the potential historical sequences that could have led to /kt/ are *kutV, *kotV (which would appear as /k^{w}t/), *kitV and *ketV (whose vowels would condition the palatalization of /t/ before syncopation), and *katV, whose non-prominent low vowel is more likely to resist syncopation than other vowels. /t͡ʃk/ only appears in loans like *chkulà* 'chocolate' and relatively uncommon syncopations of words like *chaka* → *chka* 'another'. The dental affricate /t͡s/ cannot appear before a velar or labialized velar stop, and where the affricate may be expected, the fricative /s/ appears instead, as with the related words *tzaka* /t͡saka^{X}/ 'one' and *ska* /ska^{X}/ 'one'.

A greater assortment of C_2C_1 clusters can be witnessed with a nasal adjunct is present, forming an NC_2C_1 cluster. An example of each attested NCC cluster involving two stops or affricates is given in (6).

(6) Nasal-Stop-Stop clusters

N	C_2	C_1	Example	Phonemic	Gloss
m	p	t^j	*mptyàn?*	/mpt^{j}ã?^{L}/	'earwig'
m	p	k	*^{0}mpkeè*	/mpke:$^{0\text{-}L}$/	'Miguel'
n	t	t	*nttì?*	/ntti?^{L}/	'want, like, think'
n	t	k	*^{0}ntkunà?*	/n-tkuna?$^{0\text{-}L}$/	'$_H$.get_lost'
n	t	k^w	*^{0}ntkwa*	/n-tk^{w}a$^{0\text{-}X}$/	'$_H$.sit'
n	t^j	t^j	*nttyì*	/nt^{j}t^{j}i^L/	'in a while'
n	t^j	k	*ntykula*	/nt^{j}kula^X/	'messy'
n	t^j	k^w	*ntykwe?èn*	/nt^{j}k^{w}e?ẽ^L/	'fishhook'
n	k	t^j	*yaka nktya*	/jaka^X nkt^{j}a^X/	'elephant ear tree'
n	k	t͡s	*xlyuwà nktzú*	/ʃl^{j}uwa^L nkt͡su^H/	'*islama*'
n	k	t͡ʃ	*nkchá?*	/nkt͡ʃa?^{H}/	'in vain'
n	k	k	*^{0}nkkon*	/nkkõ$^{0\text{-}X}$/	'turtle'
n	k^w	t	*^{0}nkwti*	/nk^{w}ti$^{0\text{-}X}$/	'trash'
n	k^w	t^j	*nkwtyén*	/nk^{w}t^{j}ẽ^H/	'$_C$.erase'
n	k^w	t͡s	*kooòn nkwtzá*	/kõ:^{L} nk^{w}t͡sa^H/	'tuber *camote quebrantado*'
n	k^w	t͡ʃ	*^{0}nkwchen*	/nk^{w}t͡ʃẽ$^{0\text{-}X}$/	'quail'
n	k^w	k^w	*nkkwán*	/nk^{w}k^{w}ã^H/	'weasel'

Most attested Stop-Stop clusters can also be preceded by a nasal segment to from NCC clusters (only */nt͡ʃk/ is absent). The oral stops in these clusters may be identical, as in the /nkk/ sequence of *^{0}nkkon* /nkkõ$^{0\text{-}X}$/ 'turtle', in which case the carryover voicing of the nasal ends during the long oral closure of the geminate stop, resulting in a voiceless production of the stop (i.e. /nkkõ$^{0\text{-}X}$/ → [^{n}kõ]). As discussed in § 3.3.2.2, stops of similar places of articulation must agree in any secondary articulation; that is, there are no *t^{j}t or *k^{w}k clusters. There are no attested *ntt͡s or *ntt͡ʃ sequences, and there are no Nasal-Stop-Stop sequences in which the first oral stop is an affricate, though phonetically, the affrication of /t^j/ before velar stops (§ 3.2.5) leads to phonetic [ntʃk] onsets.

4.2.1.2.2 Stop-Fricative Clusters In addition to preceding other stops, stops in CC clusters may precede fricatives. An example of each stop-fricative cluster observed in the corpus is given in (7).

(7) Stop-Fricative clusters in TAT

C_2	C_1	Example	Phonemic	Gloss
t	h	*tjeʔ*	/theʔ^{X}/	'salt'
t^{j}	h	*tyja*	/t^{j}ha^{X}/	'tortilla'
k	s	*^{0}ksùʔ*	/ksuʔ$^{0\text{-}L}$/	'old'
k	ʃ	*kxènʔ*	/kʃẽʔ^{L}/	'grass, wilderness'
k	h	*kjin*	/khĩ^{X}/	'skin'
k^{w}	s	*kwseèn*	/k^{w}sẽː^{L}/	'evening'
k^{w}	ʃ	*kwxeèʔ*	/k^{w}ʃeːʔ^{L}/	'raccoon'
k^{w}	h	*sanyì kwjàʔ*	/san^{j}i^{L} k^{w}haʔ^{L}/	'guitar'

Again, the absence of labial stops in these clusters is likely due simply to the relative rarity of labial stops in the lexicon. Though /t͡s t͡ʃ/ are not considered to contrast with /t+s t+ʃ/, there are no /t+s t+ʃ/ clusters that are analyzed as clusters rather than affricates, and are not found in the lexicon, and only the laryngeal /h/ forms clusters with the coronal stops. Though most of the /ChV/ sequences are the result of syncopation of an earlier *CVhV form, occasionally speakers may produce /CVhV/ realizations of these forms, for example, pronouncing *tjeʔ* /theʔ^{X}/ 'salt' as [te.heʔ] rather than [theʔ] or pronouncing *kjin* /khĩ^{X}/ 'skin' as [kĩ.hĩ] rather than [khĩ].

Stop-fricative sequences can also be preceded by a nasal adjunct, forming Nasal-stop-fricative clusters, as seen in (8).

(8) Nasal-Stop-Fricative clusters

N	C_2	C_1	Example	Phonemic	Gloss
n	t	h	*ntjan*	/nthã^{X}/	'treebark'
n	t^{j}	h	*ntyje takwí*	/nt^{j}he^{X}+tak^{w}i^{H}/	'G.pass'
n	k	s	*nk^{0}-saʔwe*	/nk-saʔwe$^{0\text{-}X}$/	'C-split'
n	k	ʃ	*nk^{0}-xen*	/nk-ʃẽ$^{0\text{-}X}$/	'H-roll_up'
n	k	h	*nkjo kchànʔ*	/nkho^{X} k͡tʃãʔ^{L}/	'pygmy owl'
n	k^{w}	s	*^{0}nkwson*	/nk^{w}sõ$^{0\text{-}X}$/	'threadbare'
n	k^{w}	ʃ	*nkwxǐ*	/nk^{w}ʃi^{0}/	'tomato'
n	k^{w}	h	*nkw-jàʔ*	/nk^{w}-haʔ^{L}/	'C-sleep'

The full set of possible fricatives in these clusters are only found after velar and labialized velar stops.

4.2.1.2.3 Fricative-Stop Clusters In addition to stop-fricative clusters, fricative-stop clusters appear as well. An example of each fricative-stop cluster observed in the corpus is given in (9).

(9) Fricative-Stop clusters

C_2	C_1	Example	Phonemic	Gloss
s	p	*keè ^{0}sparà*	/keː^{L} spara$^{0\text{-}L}$/	'flor de espada'
s	t	*stanʔ*	/stãʔ^{X}/	'branch'
s	t^{j}	*styiʔ*	/st^{j}i^{X}/	'milk'
s	k	*skuʔwé*	/skuʔwe^{H}/	'Juquila'
s	k^{w}	*skwàn*	/sk^{w}ã^{L}/	'dough'
ʃ	p	*^{0}xpatù*	/ʃpatu$^{0\text{-}L}$/	'shoe'
ʃ	t	*xtí*	/ʃti^{H}/	'heron'
ʃ	t^{j}	*xtyaán*	/ʃt^{j}ãː^{H}/	'milpa'
ʃ	k	*xkalá*	/ʃkala^{H}/	'dream'
ʃ	k^{w}	*xkwé*	/ʃk^{w}e^{H}/	'egg'

Notably, the laryngeal fricative /h/ does not precede stops or affricates in Tataltepec Chatino. There is not enough evidence to determine if this is a restriction on the phoneme

or an accident of the history of Tataltepec Chatino's historical development. Proto-Chatino *h is cognate to Proto-Zapotec *t, *tt, and was likely a stop at the Proto-Zapotecan stage, and therefore would have had a distribution distinct from /s ʃ/ which probably descended from Proto-Zapotecan fricatives *x, *xx (Kaufman, 1993-2007; Smith Stark, 2007). The only fricative-stop clusters involving labial stops are loanwords like *keè ⁰sparà* 'flor de espada' and *⁰xpatù* 'shoe'. Interestingly, a coronal fricative-stop sequence need not both be palatalized or plain, as evidenced by the /stʲ/ and /ʃt/ clusters of *styiʔ* 'milk', and *xtí* 'heron'.

NCC clusters may also be formed from non-laryngeal fricatives-stop sequences with a nasal adjunct, as seen in (10).

(10) Nasal-Fricative-Stop Clusters in TAT

N	C_2	C_1	Example	Phonemic	Gloss
m	s	t	*⁰mstàn*	/mstã$^{0\text{-}L}$/	'alms'
n	s	t	*⁰nstaà*	/n-sta:$^{0\text{-}L}$/	'H.place'
n	s	tʲ	*⁰nstyan*	/n-stʲã$^{0\text{-}X}$/	'P.husk'
m	s	k	*mskuʔ*	/mskuʔ^{X}/	'grasshopper'
n	s	k	*⁰nskee:*	/nske:$^{0\text{-}X}$/	'guava'
n	s	kʷ	*nskwàʔ*	/nskʷaʔ^{L}/	'maize'
n	ʃ	t	*nxteʔén*	/nʃteʔẽ^{H}/	'G.INTR.join'
n	ʃ	tʲ	*nxtyakwá*	/n-ʃtʲakʷa^{H}/	'G.help'
m	ʃ	k	*mxkàʔ*	/mʃkaʔ^{L}/	'fly'
n	ʃ	k	*lti nxkomā*	/lti^{X} nʃkoma$^{\widehat{HL}}$/	'jícama vine'
n	ʃ	kʷ	*nxkweèʔ*	/nʃkʷe:ʔ^{L}/	'crustacean sp. *conga*'

Most stops following /s ʃ/ in NCC clusters are attested, though /mst/ clusters are only found in loanwords, as with *⁰mstàn* /mstã$^{0\text{-}L}$/ 'alms' < Sp. *limosna*. Most nasal-fricative-stop clusters involve the alveolar nasal, but a few lexemes--both loans and apparently native terms--feature labial nasals instead as with *mskuʔ* /mskuʔ^{X}/ 'grasshopper'.

4.2.1.2.4 Stop-Nasal Clusters In addition to preceding stops as adjuncts, nasals may follow stops. (11) provides one example of each such attested cluster in the lexicon.

(11) Stop-Nasal clusters

C_2	C_1	Example	Phonemic	Gloss
t	m	*⁰tminkkù*	/tminkku$^{0\text{-}L}$/	'Sunday'
k	n	*teʔ kno*	/teʔ^{X}+kno^{X}/	'tablecloth'
k	n^{j}	*knyáʔ*	/kn^{j}aʔ^{H}/	'chile'
k^{w}	n	*kwnaʔá*	/k^{w}naʔa^{H}/	'mother'
k^{w}	n^{j}	*kwnyì*	/k^{w}n^{j}i^{L}/	'harvest'

All stop-nasal clusters involve segments from different points of articulation, and the only example that does not include a velar or labiovelar stop is the loan *⁰tminkkù* 'Sunday'. The only cases where /kn/ occur are the result of the dissimilation of a coronal stop-nasal sequence brought together through syncopation, as when the consonants of *tuno* /tuno^{X}/ 'big.PL' are brought together in the compound *teʔ kno* (cloth+big.PL) 'tablecloth'. Much like with the absence of /kt/ sequences, this is likely due to the fact that historic *kun *kon sequences would result in /k^{w}n/ clusters, *kin *ken sequences would result in /kn^{j}/ clusters, and *kan sequences have generally not undergone syncopation.

4.2.1.2.5 Fricative-Nasal Clusters Fricatives may also precede nasals, as seen in the examples in (12).

(12) Fricative-Nasal clusters

C_2	C_1	Example	Phonemic	Gloss
s	m	*⁰smii*	/smiː$^{0\text{-L}}$/	'citrus'
s	n	*snu*	/snu^{X}/	'inside of calabash'
s	nʲ	*snyì*	/snʲi^{L}/	'smoke'
ʃ	n	*xnèʔ*	/ʃneʔ^{L}/	'dog'
ʃ	nʲ	*xnyiʔi*	/ʃnʲiʔi^{X}/	'sad'
h	n	*jnaàʔ*	/hnaːʔ^{L}/	'RN.1SG'
h	nʲ	*⁰jnyiʔ*	/hnʲiʔ$^{0\text{-X}}$/	'P.ask_for'

Unlike with the fricative-stop clusters, where only /s ʃ/ form clusters with stops, fricative-nasal clusters involve all fricatives in Tataltepec Chatino, though such clusters involving /h/ are very infrequent compared to the clusters involving /s ʃ/. The labial nasal is only present in fricative-nasal clusters with /s/, which is likely more a product of /m/'s relative infrequency than a restriction against *ʃm sequences.

4.2.1.2.6 Stop-Liquid Clusters Stops can precede liquids /l lʲ ɾ/, as shown in the examples of stop-liquid clusters in (13).

(13) Stop-Liquid clusters

C_2	C_1	Example	Phonemic	Gloss
p	l	*ple*	/ple^{X}/	'foolish'
p	lʲ	*^{0}plyà*	/plʲa$^{0\text{-}L}$/	'water tank'
p	ɾ	*^{0}prikùʔ*	/pɾikuʔ^{L}/	'parakeet'
t	ɾ	*trí seʔèn*	/tɾi^{H} seʔẽ^{L}/	'intestines'
k	l	*klixén*	/kliʃẽ^{H}/	'Santiago Yaitepec'
k	lʲ	*klyaàʔ*	/klʲaːʔ^{L}/	'bitter'
k	ɾ	*kruǔ*	/kɾuː^{0}/	'turtledove'
kʷ	l	*kwleʔé*	/kʷleʔe^{H}/	'half'
kʷ	lʲ	*kwlyaa*	/kʷlʲaː^{X}/	'brother-in-law'
kʷ	ɾ	*kwralya*	/kʷɾalʲa^{X}/	'possum'

The liquids /l lʲ ɾ/ appear with the non-coronal stops /p k kʷ/, but only appear with the coronal stop (in the cluster /tɾ/) in the partial loan word *trí seʔèn* (guts+PSD.excrement(.3)) 'intestines' (whose first element derives from Sp. *tripas* 'guts'), and coronals do not appear with the laterals /l lʲ/. The absence of *tl and *tlʲ sequences is due to the dissimilation of coronal stop-sonorant sequences (§ 4.3.3). Where *tl or *tlʲ might be expected, as when cognate forms in other topolects contain coronal-coronal sequences (e.g. Quiahije Eastern Chatino *tlyu^{2}* 'big.SG'), Tataltepec Chatino instead shows a velar-coronal sequence (*klyuù* 'big.SG').

Clusters involving the flap /ɾ/ are typically only found in sound symbolic vocabulary (*kruǔ* 'turtledove') or loan words (*^{0}prikùʔ* 'parakeet' < Sp. *perico*), though one presumably native word, *kwralya* 'possum' contains such a cluster. Other topolects generally have a form like Zenzontepec Chatino *lyáā*, and has been reconstructed for Proto-Zapotec as *kwe-lela (of which only the final syllable is cognate for other Chatino topolects). This Proto-Zapotec form (which would be largely the same as its Proto-Zapotecan etymon) suggests a process of dissimilatory rhotacization of the first of two laterals in a stem. While

an intriguing possibility, this one token is scant evidence for such a process, and other stems with two laterals (e.g. *nkwlalù* /nk^{w}-lalu^{X}/ 'tadpole' cf. Proto-Zapotec *kwa-l-oːʔlla) do exist. Another possible mechanism would be the addition of a nasal accretion *n-* to the *lela stem, to which the *kwe- prefix was then added (i.e. a Pre-Tataltepec *kwe-n-lela. *nl would have yielded *nt in Chatino (*kwe-ntela), which alternates with or has yielded /ɾ/ in many topolects (*kwe-rela > *kwralya* by regular historical sound changes).

Stop-liquid sequences (chiefly stop-lateral sequences) can be preceded by a nasal adjunct, forming nasal-stop-liquid clusters, as seen in (14).

(14) Nasal-Stop-Liquid clusters

N	C_2	C_1	Example	Phonemic	Gloss
m	p	l	*^{0}mplinyì*	/mplin^{j}i$^{0\text{-}L}$/	'melon'
n	k	l	*nklixèn?*	/nkliʃẽʔ^{L}/	'roofing beam *güilote*'
n	k	l^{j}	*nklyaná*	/nkl^{j}ana^{H}/	'H.looks_for'
n	k	ɾ	*nkrajwa*	/nkɾahwa^{X}/	'yay wide'
n	k^{w}	l	*nkwlalù*	/nk^{w}lalu^{L}/	'tadpole'
n	k^{w}	l^{j}	*nkw-^{0}lya*	/nk^{w}-l^{j}a$^{0\text{-}X}$/	'C-scrape'

A few scattered bilabial stops are involved in loan words in nasal-stop-liquid clusters, but many of these clusters involve velar stops owing to the dissimilation of coronals stops from coronal sonorants (specifically, nasals and laterals) in clusters. For example, *nklyaná* /nkl^{j}ana^{H}/ 'H.looks for' derives from a form whose prefix was *nty-* /nt^{j}-/, and /nt^{j}-lana^{H}/ → /nt^{j}-l^{j}ana^{H}/ → /nkl^{j}ana^{H}/.

4.2.1.2.7 Fricative-Liquid Clusters Liquids can also follow fricatives, as in the clusters laid out in (15).

(15) Fricative-Liquid clusters in TAT

C_2	C_1	Example	Phonemic	Gloss
s	l	*slù yaà*	/slu^{L} ja:^{L}/	'prickly pear spine'
s	lʲ	*slyaʔ*	/slʲaʔ^{X}/	'cotton'
ʃ	l	*xloo niʔi*	/ʃlo:^{X} niʔi^{X}/	'*greeting*'
ʃ	lʲ	*xlyatén*	/ʃlʲatẽ^{H}/	'birdsnest'
h	l	*jloʔô*	/hloʔo^{0L}/	'Tataltepec'
h	lʲ	*jlyá*	/hlʲa^{H}/	'fart'
h	ɾ	*ljya ^{0}jrayà*	/l̥ja^{X} hɾaja$^{0\text{-}L}$/	'striped sugarcane'

The laterals appear with all fricatives, and /h/ appears with the flap in the loan *ljya ^{0}jrayà* 'striped sugarcane' < 'sugarcane' + Sp. *rayado*. Chatino topolects differ in the treatment of Spanish's /r/, which is frequently realized as a voiceless trill [r̥] or a approximant [ɹ̥] in many environments in the Afro-Mestizo speech of the nearby Costa Chica region (Rosas Mayén, 2007), and in some dialects of Dominican Spanish as a pre-aspirated flap [ɦɾ] or trill [ɦr] (Lipski, 1994; Willis, 2006), which resembles the /hɾ/ clusters in Chatino. Zenzontepec Chatino and Tataltepec Chatino generally show [ɾ] where Spanish sources have /r/, though Zacatepec Eastern Chatino and this one lexeme of Tataltepec Chatino show /hɾ/ clusters instead.

4.2.1.2.8 Liquid-Stop Clusters Liquids may also precede other consonants word-initially. In (16), we can see examples of liquids preceding stops.

(16) Liquid-Stop clusters in TAT

C_2	C_1	Example	Phonemic	Gloss
l	t	*ltí*	/lti^{H}/	'vine'
l	t^{j}	*ltyi*	/lt^{j}i^{X}/	'placenta'
l	t͡s	*ltzìì*	/lt͡si:^{L}/	'San Marcos Zacatepec'
l	t͡ʃ	*ntuu lchiʔ*	/ntu:^{X} lt͡ʃiʔ^{X}/	'sweetbreads'
l	k	*lkaa*	/lka:^{X}/	'all'
l	k^{w}	*lkwén*	/lk^{w}ẽ^{H}/	'image'

The lateral /l/ can precede any stop or affricate. Only /p/ is not found following /l/. The palatalized lateral is not analyzed in these contexts, and further articulatory research would be necessary to determine if the lateral fricative present in /lt^{j}/ clusters is itself produced with a palatal or palatalized articulation.

Tataltepec Chatino has no /ɾ/-initial clusters. Where such clusters exist in other Chatino topolects, they are found in loan words, as with Zacatepec Eastern Chatino's *rsòōn˝* /ɾsõ:^{K}/ 'message, respect' (< Sp. *razón*) and *rkàlē˝* /ɾkale^{K}/ 'mayor' (< Sp. *alcalde*).

4.2.1.2.9 Liquid-Fricative Clusters Liquids may also precede fricatives, as in the examples in (17).

(17) Liquid-Fricative clusters in TAT

C_2	C_1	Example	Phonemic	Gloss
l	j̊	*ljya*	/lj̊a^{X}/	'sugarcane'
l	s	*^{0}lsuʔ pa*	/ls̊uʔ$^{0\text{-}X}$ pa^{X}/	'magpie'
l	h	*lja*	/lha^{X}/	'between'

Liquid-fricative clusters are formed from the syncopation of non-prominent vowels (cf. TAT *ljya* /lj̊a^{X}/ and ZAC *lijya* /lihja^{A}/ 'sugarcane'. Unlike before stops, laterals in lateral-fricative clusters are not produced as voiceless fricatives.

As mentioned above, Tataltepec Chatino has no /ɾ/-initial clusters.

4.2.1.2.10 Stop-Glide Clusters Stops can be followed by the glides /w j j̥/, as shown in the examples in (18).

(18) Stop-Glide clusters in TAT

C_2	C_1	Example	Phonemic	Gloss
t	w	*t-^{0}wè*	/t-we$^{0\text{-}L}$/	'P.TR-slice'
t	j̥	*tjyu*	/tju^{X}/	'*jiote*'
tʲ	w	*tywìʔ*	/tʲwiʔ^{L}/	'*chahuistle*'
tʲ	j̥	*tyjyàn*	/tʲj̃ã^{L}/	'bone'
t͡s	w	*tzwiíʔ*	/t͡swi:ʔ^{H}/	'a few days ago'
k	j	*kyaʔ*	/kjaʔ^{X}/	'foot'
k	j̥	*k^{0}-jya*	/k-ja$^{0\text{-}X}$/	'P.play'
k	w	*kwèʔ*	/kweʔ^{L}/	'pig'
kʷ	j̥	*kwjyà*	/kʷj̥a^{L}/	'game'

The labial glide forms clusters with nearly all stops in the language, save for the labial /p kʷ/ (§ 4.3.5). The voiced palatal glide forms clusters infrequently, with *kyaʔ* /kjaʔ^{X}/ being the only common instance of a /Cj/ cluster. The voiceless glide /j̥/ can form clusters with coronal and velar stops.

The existence of /kw/ sequences in addition to /kʷ/ segments is based on observations that the labial offglide of /kw/ sequences is longer than that of /kʷ/ sequences, and /kw/ sequences correspond to historic Proto-Chatino *kuwV sequences. Since /kw/ sequences result from stems which have undergone vowel syncopation, they tend to precede short vowels, whereas /kʷ/ sequences precede both short and long vowels, and no minimal pairs have been found contrasting /kw/ with /kʷ/. Additionally, it is not known at this time if this difference is something speakers are aware of or not. While this distinction is

made in the phonemic orthography, no distinction is made in the practical orthography. Other syncopated Chatino topolects report a similar phonetic contrast between /kw/ and /k^{w}/ (Rasch, 2002).

In a few clusters shown in (19), stop-glide sequences are preceded by a nasal adjunct.

(19) Nasal-Stop-Glide Clusters in TAT

N	C_2	C_1	Example	Phonemic	Gloss
n	t	w	*^{0}ntwè*	/n-twe$^{0\text{-}X}$/	'H.TR.slice'
n	t	j	*taʔà ^{0}ntjyoʔo*	/taʔa^{L} ntjoʔo$^{0\text{-}X}$/	'May festival'
n	t^{j}	w	*kiiʔ ^{0}ntywiì*	/ki:ʔ^{X} nt^{j}-wi:$^{0\text{-}L}$/	'firefly'
n	k	j	*yaka nkyuʔ*	/jaka^{X} nkjuʔ^{X}/	'candle tree'

The labial glide /w/ appears after coronal stops and the plain velar stop. Much like a slight difference in articulation can be identified between /kw/ clusters and /k^{w}/ segments, a distinction between /nkw/ and /nk^{w}/ clusters is possible, but no such /nkw/ clusters have been clearly identified, and it is unclear if speakers would find them contrastive if they existed.

4.2.1.2.11 Fricative-Glide Clusters Glides may also be preceded by fricatives, as with the examples in (20).

(20) Fricative-Glide clusters in TAT

C_2	C_1	Example	Phonemic	Gloss
s	w	*swe*	/swe^{X}/	'small.PL'
s	j	*^{0}krasyà*	/kɾasja$^{0\text{-}L}$/	'heart'
ʃ	w	*^{0}nsatèn xwií ri*	/nsatẽ$^{0\text{-}L}$ ʃwiː^{H} ɾi^{X}/	'*ciruela pajarita*'
ʃ	j	*^{0}xyaʔ ti*	/ʃjaʔ$^{0\text{-}X}$ ti^{X}/	'little bit'
h	w	*jwiʔnya*	/hwiʔnʲa/	'scarcity'

The fricatives /s ʃ h/ forms clusters with the voiced glides /w j/. It is unclear if the absence of /j̬/ in clusters with these fricatives is the result of the paucity of /j̬/ or some restriction. /h/ only forms clusters with the glide /w/, which is variably realized as [ɸ] or [(h)ʍ]. It is not clear if there are any /h+j/ clusters in the language which contrast with the /j̬/ segment.

4.2.1.2.12 Glide-Stop Clusters In a few words, glides may precede stops, as seen in the examples in (21).

(21) Glide-Stop clusters in TAT

C_2	C_1	Example	Phonemic	Gloss
w	tʲ	*wtyi*	/wtʲi^{X}/	'dry'
w	t͡ʃ	*wchá*	/wt͡ʃa^{H}/	'day after tomorrow'
j	k	*ykuʔ*	/jkuʔ^{X}/	'fist'
j	kʷ	*ykwá*	/jkʷa^{H}/	'gruel'

In these clusters, a voiced glide precedes a stop and is realized as a voiceless fricative (i.e. *wtyi* /wtʲi^{X}/ → [ɸtʲi] 'dry' and *ykuʔ* /jkuʔ^{X}/ → [çkuʔ] 'fist'). Given this neutralization between voiced and voiceless glides, there are no observed clusters of /j̬/ preceding a voiceless stop.

4.2.1.2.13 Liquid-Glide Clusters Glides and liquids may forms clusters, as seen in the examples of liquid-glide clusters in (22).

(22) Liquid-Glide clusters in TAT

C_2	C_1	Example	Phonemic	Gloss
l	w	*lwiì*	/lwi:^{L}/	'clean'
l	j̊	*ljya*	/lj̊a^{X}/	'sugarcane'
ɾ	j	*^{0}saryù*	/saɾju$^{0\text{-}L}$/	'rosary'
ɾ	w	*rwe*	/ɾwe^{X}/	'violin'

Only liquid-glide clusters involving the lateral are found in native vocabulary in Tataltepec Chatino, as those involving the flap are loans from Spanish. Though a /l+j/ cluster could theoretically differ from a /l^{j}/ segment, there is no evidence suggesting that such /l+j/ clusters exist in Tataltepec Chatino.

Only one lexeme shows a glide-liquid CC cluster, *wlí nkiʔīn* /wli^{H} nkiʔĩ$^{H\widehat{L}}$/, the name of a kind of fly. Since this labial is pre-consonantal, it could be represented as /β̪li^{H} nkiʔĩ$^{H\widehat{L}}$/, or could represent a loan from an unknown language.

Many more combinations of consonants are found in the more complex NCC clusters, in which a CC cluster has a nasal adjunct.

4.2.1.2.14 Unattested Classes of CC Clusters There are no instances of fricative-fricative clusters (i.e. *sh, *hʃ) in the lexicon, nor are there any examples of glide-fricative clusters apart from *ihan* 'year' should it be analyzed as /jhã^{X}/ rather than /ihã^{X}/.

4.2.1.3 (N)CCC clusters

Apart from a few loanwords, all (N)$C_3C_2C_1$ clusters in Tataltepec Chatino have the same format, C_3 is a stop (most often velar or labialized velar, though coronals are also common), C_2 is a fricative (/s ʃ h/ are all attested), and C_1 is most often a sonorant (/l^j, n^j/ follow coronal fricatives, /w/ follows /h/), but can also be a stop. These $C_3C_2C_1$ clusters can be preceded by a nasal adjunct. Among loan vocabulary, a few more types of cluster are attested.

4.2.1.3.1 Stop-Fricative-Sonorant Clusters Most (N)CCC clusters are formed of a stop followed by a fricative, then a sonorant. While a few of these clusters are found in loan vocabulary, a great number of them are found in inflected verb stems in which a (N)C- prefix is attached to a verb stem beginning with a CC cluster, as can be seen in (23). When C_1 is a labialized velar and is preceded by a nasal, as in the Completive prefix *nkw-*, many speakers pronounce this NC sequence as [m], coalescing the labial and nasal gestures of the /nk^w/ into one sound.

(23) Stop-Fricative-Sonorant clusters

N	C_3	C_2	C_1	Example	Phonemic	Gloss
n	t	h	w	*nt-^{0}jwiʔ*	/nt-hwiʔ$^{0\text{-}X}$/	'H-sell'
	k	h	w	*k-^{0}jwi*	/k-hwi$^{0\text{-}X}$/	'P-kill'
	k^w	s	l^j	*kwslyaʔ*	/k^wsl^jaʔ^X/	'sheep'
	k^w	s	n^j	*niʔi ^{0}kwsnyà*	/niʔi^X k^wsn^ja$^{0\text{-}L}$/	'kitchen'
n	k^w	s	n^j	*nkwsnyii*	/nk^w-sn^ji:^{X}/	'C-grab'
	k^w	ʃ	l^j	*kwxlyaʔ*	/k^wʃl^jaʔ^X/	'badger'
n	k^w	h	l^j	*nkw-^{0}jlya*	/nk^w-hl^ja$^{0\text{-}X}$/	'C-burl_cotton'
n	k^w	h	n^j	*nkwjnyiʔ*	/nk^w-hn^jiʔ^X/	'C-borrow'

4.2.1.3.2 Stop-Fricative-Stop Clusters

While less numerous than the stop-fricative-sonorant clusters, the addition of an NC prefix to a stem beginning with a CC cluster also produces stop-fricative-stop clusters in native vocabulary, as seen in (24).

(24) Stop-Fricative-Stop clusters

N	C_3	C_2	C_1	Example	Phonemic	Gloss
n	k^w	s	t	*nkw-^{0}staà*	/nk^w-sta:$^{0\text{-L}}$/	'C-place'
n	k^w	s	k	*nkw-s-kán?*	/nk^w-s-kã?^{H}/	'C-TR-tie_up'

4.2.1.3.3 Other (N)CCC clusters

A handful of (N)CCC clusters do not show either of the preceding forms, and as seen in (25), are found only in Spanish loans (*^{0}skranò* < *escríbano* and *^{0}mstrù* < *maestro*).

(25) Other (N)CCC clusters

N	C_3	C_2	C_1	Example	Phonemic	Gloss
	s	k	ɾ	*^{0}skranò*	/skɾano$^{0\text{-L}}$/	'secretary'
m	s	t	ɾ	*^{0}mstrù*	/mstɾu$^{0\text{-L}}$/	'teacher'

4.2.1.4 Sonority Sequencing Principle

Many clusters in Tataltepec Chatino violate the Sonority Sequencing Principle (Kenstowicz, 1994, 254), which states that the relative sonority of segments should not increase from the nucleus of a syllable to its margins. Figure 4.1 lists the CC consonant clusters which violate the SSP. By sheer frequency of the clusters, the most common such clusters involve nasals followed by obstruents (/mp m$\widehat{\text{tʃ}}$ ms mʃ nt nt^j nk nk^w n$\widehat{\text{ts}}$ n$\widehat{\text{tʃ}}$ ns nʃ/). The nasal may be considered to be an adjunct to the syllable rather than part of the onset cluster itself, paralleling analyses of the /sC/ clusters of English. Another common pattern is for an oral sonorant (/l j w/) to precede a stop or affricate, in which case the

sonorant is devoiced and appears as a voiceless fricative allophone ([ɬ ç ɸ]). This devoicing does not occur before fricatives, however.

Nas-Obs	mp						m͡ʃ	ms	mʃ
		nt [ⁿd]	nᵗʲ [ⁿdʲ]	nk [ᵑg]	nkʷ [ᵑgʷ]	n͡ts	n͡ʃ	ns	nʃ
		ntt [ⁿt]	nᵗʲtʲ [ⁿtʲ]	nkk [ᵑk]	nkʷkʷ [ᵑkʷ]				
Son-Obs		lt [ɬt]	lᵗʲ [ɬtʲ]	lk [ɬk]	lkʷ [ɬkʷ]	l͡ts [ɬts]	l͡ʃ [ɬtʃ]	ls	
			wᵗʲ [ɸtʲ]				w͡ʃ [ɸtʃ]		
				jk [çk]	jkʷ [çkʷ]				
Fric-Stop	sp	st	stʲ	sk	skʷ				
	ʃp	ʃt	ʃtʲ	ʃk	ʃkʷ				
				tʲk [tʃk]	tʲkʷ [tʃkʷ]				
				t͡ʃk					

Figure 4.1: Clusters Violating the SSP

4.2.2 Codas

Tataltepec Chatino has a very small set of permissible coda consonants; in fact, in native non-sound symbolic vocabulary there is precisely one, the glottal stop /ʔ/. In non-native vocabulary, chiefly more recent loans from Spanish, the flap /ɾ/ can serve as a word-internal coda. Lexemes with flap codas are listed in Table (26).

(26) Lexemes containing non-glottal codas

kwchí ⁰martà	/kʷt͡ʃiᴴ marta⁰-ᴸ/	'cacomistle (?)'	*marta*
nkarnara	/nkaɾnaraˣ/	'passion fruit'	*granada*
⁰merkù	/meɾkuᵒ-ᴸ/	'Wednesday'	*miércoles*
ntaa kwartà	/ntaːˣ kʷartaᴸ/	'bean (sp.)'	*(frijol de) cuarta*
⁰xartà	/ʃarta⁰-ᴸ/	'sacristan'	*sacristán*

In most of these codas the flap corresponds to a flap /ɾ/ or a trill /r/ in its Spanish sources. That said, one of these stems, *bartzuʔ* '*guamúchil*', does not appear to be a Spanish loan.

The peculiar syllable structure of this stem, which appears in related lexemes[6] could be explained by being a loan from some as-yet unidentified source.[7]

Notably, this marginal /ɾ/ coda is only rarely seen in final syllables: only the partially nativized loan *par* /paɾ^{X}/ 'pair' has a word-final /ɾ/. Spanish infinitives, when borrowed into Tataltepec Chatino in the very productive verb periphrasis) are borrowed without the final tap (e.g. *nkwa-ʔnì kana* (C-do(.3) win) 's/he won' (cf. Sp. *ganar*, 'win, earn, triumph')).

Given the particularities of the distribution of glottal stop in Tataltepec Chatino and the different analyses of glottal stop across descriptions of Zapotecan languages, it is useful to motivate this analysis's treatment of /ʔ/ as a consonantal phoneme rather than as a vocalic or prosodic feature.

While analyses of Chatino languages tend to consider the glottal stop to be a consonantal phoneme, instances of glottal stop in Zapotec languages are typically considered a vocalic or prosodic feature. Other languages in which only one glottal stop may occur in a stem, such as most Mixtec topolects[8] and some Tucanoan languages have been analyzed as being the realization of the stem-linked feature [+constricted glottis]. The optimal anal-

[6]Viz. *ya bartzuʔ* '*Pithecellobium dulce*, *palo de guamúchil*', *ya bartzuʔ kcheʔ* (lit. 'spiny *bartzuʔ* tree') '*palo de guamuche*' and *ya bartzuʔ styiʔ* (lit. 'milky *bartzuʔ* tree') '*palo de piñón*'.

[7]Mixtec and Zapotec similarly fail to demonstrate a ready source for *bartzuʔ*: Xochapa (Southern Baja/Guerrero) Mixtec has *chìkún* /t͡ʃ̃ikũ/ for '*guamúchil*' (Stark et al., 2003), and Juchitán (Central) Zapotec has *biquiiche* /bíkɨ̰ɨtʃé/ for the same type of tree (Pickett, 2007). The medial /ɾC/ cluster may suggest an origin in Papabuco, where /r/ is present a number of class terms including *bir-* (< *bigy* `frog'), *ur-* (< *uugy* `ball, fruit'), and *yar-* (< *ya* `tree' + *ur-* `CL:fruit'), as in *birgye'* `toad', *urwizi* `lime', and *yarlich* `nanche tree' (Speck & Marcial López, 2014).

[8]With the exception of the Ayutla de los Libres and Santa María Zacatepec topolects (Pankratz & Pike, 1967; Towne, 2011), which retain Proto-Mixtec's stem-final glottal stops (Josserand, 1983), and therefore require a different synchronic analysis, as Macaulay and Salmons (1995) point out.

ysis of Tataltepec Chatino's glottal stop must then choose between several possibilities:

- ʔ is the result of a prosodic feature associated with certain stems
- ʔ is the result of a prosodic feature associated with certain tone sequences
- ʔ is the result of a vocalic feature
- ʔ is a consonant phoneme

Each of these will be discussed in turn.

Glottal stop is sometimes analyzed as the result of a prosodic feature associated with certain stems, as with some analyses of Chalcatongo Mixtec (Macaulay & Salmons, 1995), Kotiria (Stenzel, 2007), and Danish (Clements & Keyser, 1983, 84). In these languages each stem may be marked with a [+constricted glottis] feature which is realized as a glottal stop following the stressed vowel (σ_S) of the stem (represented in Fig. 4.2 as ω), which is always the first vowel in Mixtec. For example, Figure 4.2 shows that *uù* 'two' and *úʔu* 'hurt' share the same segmental form /uu/, but differ in the presence of a [+constr.gl.] feature, which is realized on 'hurt' as a glottal stop after the first (i.e. stressed) vowel. Similarly, disyllabic stems with medial consonants can either lack this [+constr.gl.] feature as with *kɨtɨ* 'animal', in which case the word appears as CVCV, or it may possess this feature as with *kóʔlo* 'turkey', in which case the glottal stop is inserted between the first, stressed vowel and the medial consonant (CVʔ.CV).[9] Further evidence that /Vʔ/ share a mora comes from the shortening of the vowel preceding the glottal stop.

[9]Macaulay and Salmons (1995, 55) acknowledge that this analysis is not suitable for those Mixtec languages which feature stem final glottal stops, such as the topolects of Santa María Zacatepec and Ayutla de los Libres. For these topolects which feature CV.(C)Vʔ and CVʔ.(C)Vʔ stem shapes (e.g. AYU /$t^{y}o^{3}$kóʔ^{1}/ 'ant' and /$t^{y}o$ʔ^{3}kóʔ^{1}/ 'flea' (Pankratz & Pike, 1967, 288)) in addition to the CVʔ.(C)V shapes found Chalcatongo Mixtec, the glottalization would be analyzed as a feature of syllables rather than stems.

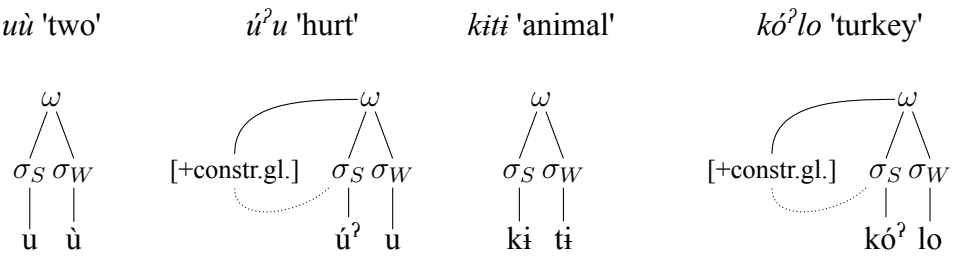


Figure 4.2: Glottalization as a feature of the root in Chalcatongo Mixtec

Such an analysis is not possible for Tataltepec Chatino since the glottal stop may appear as a coda to the prominent syllable (CV.CV?), as the onset of the prominent syllable (CV.?V), or as a coda of a non-prominent penultimate syllable (CV?.CV). Furthermore, there is no evidence of vowel shortening before glottal stop outside of the V?V context.[10]

Glottal stop has been analyzed as a prosodic feature of a tone class in Coatec Zapotec. This language has a set of five tone classes: high, low, rising, falling, and glottal, as in (27). Coatec Zapotec's "glottal tone" is not the only source of glottalization in the language, however, as glottalization (and greater vowel duration) is also present in words with rising and low tones.

(27) Tones of Coatec Zapotec (Beam de Azcona, 2004, 102)

high	*mbé*	[mbe˥]	'crab'
low	*mbè*	[mbe:ˀ˩]	'mist'
falling	*mbê*	[mbe˥˩]	'spider'
rising	*mbě*	[mbe:ˀ˩˥]	'turtle'
glottal	*mbe*^{7}	[mbeʔ˥]	'moon, butterfly'

[10] Another possible way that /ʔ/ may interact with prosody is that it may be a consonantal feature that can occur as a coda or as an onset (if CV?CV is parsed as CV.?CV), but only within a stressed syllable. While the prosodic structure appears to be important for the distribution of Tataltepec Chatino's /ʔ/, other evidence I consider below suggests that /ʔ/ is a consonant in this language.

Just as much inflectional and derivational morphology in Tataltepec Chatino has a tone sequence replacement exponent (Ch. 9), the same is true of Coatec Zapotec. For example, intransitive stems like -*lákè* 'be reduced' and -*tè* 'become scarce' may feature one tone class (in this case low on the final vowel) but show a different tone class when these same roots are inflected as transitive stems like -*lákë*^{7} 'reduce' and -*të*^{7} 'finish off'. All instances of glottal stop (apart from those associated with the glottalized dental stop phoneme /t^{ʔ}/ and some optional phonetic creakiness associated with the ends of rising and falling tones) occur in words associated with the glottal tone and share similar mid-to-high rising F0 gestures.

This analysis is not available for Tataltepec Chatino since glottal stop occurs with all lexical tone classes (as demonstrated in (28)), and doubling the number of tone classes (to have both /H/ and /H^{ʔ}/ for example) would be sub-optimal and would still fail to account for how glottal stop can appear in various locations (CV.CVʔ, CV.ʔV, CVʔ.CV) in a word.

(28) All lexical tones appear with /ʔ/ codas

/X/	*siiʔ*	/siːʔ^{X}/	'side'
/0-X/	*^{0}xalaʔ*	/ʃalaʔ$^{0\text{-}X}$/	'will cool (it)'
/L/	*chònʔ*	/t͡ʃõʔ^{L}/	'back'
/0-L/	*^{0}nkukàʔ*	/nkukaʔ$^{0\text{-}L}$/	'board'
/H/	*chúʔ*	/t͡ʃuʔ^{H}/	'coati'
/0L/	*wichîʔ*	/wit͡ʃiʔ^{0L}/	'son!'
/H͡L/	*xkwiīʔ*	/ʃk^{w}iːʔ$^{H\widetilde{L}}$/	'nothing but'
/0/	*saăʔ*	/saːʔ^{0}/	'parrot (sp.) *cotorra*'

Many analyses of Zapotec languages lack consonantal glottal stop, but demonstrate no shortage of glottal constriction. In these languages, glottal constriction (including interrupted and glottalized vowels) as well as [+ spread glottis] features like breathy voice,

are treated as vocalic features, as in Quiaviní Zapotec, where vowels may be modal (/V/), creaky (/V̰/), breathy (/V̤/), or "interrupted" or "checked" (/Vˀ/, which is variously realized as vowel-final glottal closure [Vˀ] which could be preceded by a period of creaky voice [V̰ˀ] or followed by a voiceless echo vowel [Vˀ̰]) (Chávez Peón, 2010; Munro, López, Méndez, García, & Galant, 1999). These voice distinctions partially intersect with lexical tone in this and other Zapotec languages. Treating glottal stops as part of a vocalic feature is also useful for languages like Quiaviní Zapotec where glottal stop does not appear to occupy a consonantal slot in codas.

This analysis is not favored for Tataltepec Chatino since such a vocalic feature would add an additional feature in which vowels may contrast (adding voice to the features of length, nasality, and quality) in an attempt to simplify possible syllable structures, by eliminating coda consonants from native vocabulary. Glottalization would also be an atypical autosegmental feature in that it would have a different distribution than other features. Whereas other contrastive vowel features focus on the final, prominent syllable as the locus of maximum distinctions, with reduced distinctions on non-prominent, non-final syllables, the hypothetical glottalized /Vˀ/ vowels of Tataltepec Chatino would appear in both final and non-final syllables. Unlike nasality and the restricted mid-vowel qualities /e o/, which only or mostly appear in penultimate syllables if licensed by a nasal or mid vowel in the final prominent syllable, /Vˀ/ would appear commonly in non-prominent penultimate syllables where there is no such vowel in the stem's prominent final vowel, meaning that different vowel features would have distinct distributions.

Finally, the increasingly common presence of the unquestionably consonantal /ɾ/ as a coda in nativized loans means that positing a series of checked vowels would not entirely

eliminate codas from the synchronic grammar of the language.

I follow other recent analyses of Chatino languages in treating glottal stop as a consonant (E. Campbell, 2014; E. Cruz, 2011; McIntosh, 2011; Rasch, 2002; Villard, 2008). This allows for its occurrence in the various places throughout the roots and stems in which it is found.[11] The one-glottal-stop-per-stem restriction of Tataltepec Chatino, which is also found in the non-sound-symbolic vocabulary of every Chatino language I have sufficient vocabularies for,[12] is seen not as the effect of a synchronic autosegmental association of glottal constriction to stems, but rather as the residue of processes taking place in the development of Proto-Chatino from Proto-Zapotecan, as Proto-Chatino has at most one glottal stop per stem, even for stems which contain two glottal stops in Proto-Zapotec reconstructions (E. Campbell, in press).

As mentioned earlier, a non-consonantal analysis of glottal stop would simplify the inventory of syllable shapes for native Tataltepec Chatino vocabulary, as such analyses have for some Mixtec, Tucanoan, and Western Highlands Trans New Guinea languages which contain no codas after analyzing the glottal stop as a feature of stems or vowels (Deibler, 1988; Macaulay & Salmons, 1995; Stenzel, 2007). However, as mentioned above, another coda consonant, /ɾ/ has begun to be present in nativized loans to the point where coda consonants must be present in the language, so reanalyzing the glottalization as a

[11] Rasch (2002) considers most glottal stops--those which occur word-initially before vowels as well as word-final codas--as singleton consonant phonemes, but others he treats as part of complex glottalized sonorant phonemes (/ˀj, ˀw/ etc.). Rasch arrived at a singleton analysis of these segments through phonotactic considerations in Yaitepec Eastern Chatino which are distinct from those of Tataltepec Chatino.

[12] To wit: Yaitepec Eastern Chatino (Rasch & Suárez Martínez, in press), Zenzontepec Chatino (E. Campbell & Carleton, in press), Quiahije Eastern Chatino (E. Cruz, Cruz, & Woodbury, 2010), and Zacatepec Eastern Chatino (Villard, 2011-2014).

vowel feature would only complicate the phonology, not simplify it. Even if one excludes words with /ɾ/ codas as not being part of nativized vocabulary, there are other examples of languages where consonantal glottal stop is the only possible coda consonant. Apart from non-prosodic glottalization analyses of Mixtec and Tucanoan languages, these languages include several Western Highlands languages of New Guinea where glottal stop is the only coda consonant (Agnew & Pike, 1957; Deibler, 1976; Haiman, 1980). In one of these languages, Yagaria, the consonantal nature of the glottal stop is further evidenced by consonant mutations and coalescence in medial ʔC clusters, as shown in (29).

(29) Medial ʔC clusters in Yagaria (Haiman, 1980, 19)

ʔg	→	k	ʔβ	→	p	ʔr	→	t
ʔm	→	b	ʔf	→	p	ʔh	→	f, s

Therefore, the optimal analysis of glottal stop codas in Tataltepec Chatino is to treat them as consonants given that other languages have been observed as having glottal stop as the only permissible coda, that coda-having syllable shapes are now part of the language thanks to the /ɾ/ codas of Spanish loans. The addition of separate vowel or autosegmental features cannot account for the distribution of glottal stop codas and will only serve to add unnecessary complexity to the language's phonology.

One final alternative analysis is left to consider. The glottal stop phenomena may have different sources, with some surface glottal stops being consonantal, and others having a different source. This is the case for glottal stops in the Fuzhou dialect of Eastern Min where glottal stops descending from *k behave as consonants (i.e. are not elided) while glottal stops descending from *ʔ are floating segments which are only linked in pre-

pausal environments (Chan, 1990), as seen in (30).

(30) Consonantal glottal stops are not elided in Fuzhou Eastern Min

/ʔ/ < *ʔ	*paʔ*	*mi*	→	*pami*
	'white'	'rice'		'white rice'
/ʔ/ < *k	*laʔ*	*mui*	→	*laʔmui*
	'wax'	'plum'		'wax plum'

Some analyses of Zapotec languages contain both consonantal glottal stop and glottalized vowels: Yalálag Northern Zapotec has consonantal glottal stop word-finally (/Vʔ/ realized with a glottal closure at the end of the vowel [Vʔ]) as well as laryngealized vowels (/Vˀ V/ which are either realized as an interrupted vowel [VʔV] or as a creaky voiced vowel [V̰ː]) (Avelino Becerra, 2004), and Juchitán Isthmus Zapotec's laryngealized vowels alternate with Vʔ sequences in certain morphophonological contexts (Pérez Báez & Kaufman, 2012). An analysis of Tataltepec Chatino as having both consonantal glottal stop (when occuring as codas both medially (CVʔCV) and word-finally (CVCVʔ) as well as vowel laryngealization (which I analyze as VʔV sequences) is possible. This vowel laryngealization would have a similar distribution to vowel length and nasalization in that the putative laryngealized vowels would only occur in prominent syllables, and never in penultimate syllables. In other words, CVʔV and CVCVʔV sequences are possible, but *CVʔVCV sequences do not exist.

Despite the analytical elegance that adding [+constricted glottis] to the list of autosegmental features may provide, I analyse intervocallic glottal stop as a consonant on the basis of its phonetic realizations (especially in hyperarticulate speech) and that CVʔV words behave more like CVCV words than CVV or CV words according to the realization of

lexical tone classes.[13]

Though Tataltepec Chatino does not have the very strong phonological evidence of intervocalic glottal stop's consonantal status that can be found for Zenzontepec Chatino on the basis of a speech game involving the transposition of syllables,[14] the intervocalic glottal stops of Tataltepec Chatino are considered to be consonants in part because speakers consider them as such and will produce [V.ʔV] realizations of such sequences in careful speech (with fully modal vowels separated by complete glottal closure) even though these sequences are can be pronounced as with a very short vowel before the glottal closure [^{V}ʔV] or even as a vowel whose first portion is creaky voiced [V̰V]. Furthermore, words with CVʔV shapes pattern like CVCV words rather than CVV or CV words in their realization of lexical tones (Ch. 5).

4.2.3 Vowel Restrictions

Since unstressed syllables are not afforded the full range of phonological contrasts, while any possible nucleus may occur in a stressed (i.e. stem-final) syllable, there are restrictions on what kinds of nuclei are possible for unstressed syllables. Specifically, phonological contrasts of length and nasalization are neutralized (all non-prominent vowels are short, oral and non-laryngealized) and mid-height vowel qualities /e o/ generally

[13] The importance of lexical tone in Otomanguean phonology is underscored here; Macaulay and Salmons (1995) find tonal evidence in Chalcatongo Mixtec that supports a prosodic analysis of glottalization given that the opposite pattern is observed there: CVʔV sequences behave like CVV and not CVCV sequences with regards to various tonal phenomena.

[14] A simplification of the rule of the speech game is $C_1V_1C_2V_2 \rightarrow C_2V_2C_1V_1$. Words with intervocallic glottal stop like *nyáʔa* 'mother' are produced as *ʔánya* in the game. See E. Campbell (2014, 218-230) for a thorough treatment of the particulars of the *ntikwiʔ tzūʔ ntīlú* 'speaking backwards' ludling of Zenzontepec Chatino.

only appear when licensed by either translaryngeal vowel harmony or the presence of a mid vowel in the prominent syllable. Since some of these restrictions are the result of the distribution of autosegmental features (Ch. 2), length and nasalization restrictions will only be briefly summarized here.

One vowel restriction unrelated to stress is the absence of a high-front nasal vowel before a glottal stop. The high front nasalized vowel /ĩ/ cannot occur with a glottal coda (*/ĩʔ/). Since there is no inflectional or derivational morphology in Tataltepec Chatino which adds a glottal stop to the end of a stem, this restriction is difficult to identify as a synchronic process.[15] Other Chatino topolects such as Quiahije Eastern Chatino do feature this sequence, in words like *ktyinq*^{H} /kt^{j}ĩʔ^{H}/ 'blind', *kxinq*^{M} /kʃĩʔ^{M}/ 'wilderness' and *sinq*^{L} /sĩʔ^{L}/ 'nose'; each of these /ĩʔ/ sequences corresponds to a /ẽʔ/ sequence in Tataltepec Chatino, /k^{w}t^{j}ẽʔ^{H}/, /kʃẽʔ^{L}/, and /sẽʔ^{X}/, respectively.

This restriction on /ĩ/ before /ʔ/ together with the neutralization of /o/ and /u/ when nasalized means that al five oral vowels can appear before the coda /ʔ/, but only three nasal vowels can occur with the coda: /ãʔ ẽʔ õʔ/.

4.3 Co-occurrence restrictions

A number of observations can be made about the co-occurrence of certain sounds in the Tataltepec Chatino lexicon.[16] The coronal stop-sonorant sequences present in other

[15]There are processes which add a phoneme of nasalization to the final vowel of a stem, meaning that nasalization can be applied to an underlying /iʔ/, and the resulting vowel in these cases is always mid /ẽʔ/. While this is consistent with a restriction on /ĩ/ before /ʔ/, these examples are not good evidence for this analysis since an additional process of vowel lowering cannot be dismissed out of hand.

[16]Other restrictions not considered here are the fact that non-final mid vowels are quite uncommon in native roots, that the high front vowel /i/ does not occur with both nasalization and a glottal coda, and the

Chatino languages are absent. The glides /j/ and /w/ do not precede their similar vowels /i/ and /u/, though they may follow these vowels. Additionally, a labial consonant does not precede a labial vowel, and it appears that only one labial consonant can be present in a root. The follow sections will discuss each of these restrictions in turn.

4.3.1 Constraint against multiple glottal stops

A word in Tataltepec Chatino contains at most one glottal stop. This restriction is still present throughout the native, non-sound-symbolic lexica of other Chatino languages (E. Campbell & Carleton, in press; Rasch & Suárez Martínez, in press; Villard, 2011-2014). Though the reconstruction of Proto-Zapotecan glottal stops is by no means definitive, E. Campbell (in press) notes that Proto-Zapotec forms that have been reconstructed by Kaufman (1993-2007) with multiple glottal stops are cognate to Proto-Chatino forms that contain at most one glottal stop, as seen in Table 4.5.

Gloss	Proto-Zapotec	Proto-Chatino
'chili pepper'	*ki:ʔnaʔ	*kìnáʔ
'pimple'	*keʔtzuʔ	*kètzúʔ
'flat, level'	*laʔttyiʔ	*natęʔ
'meat'	*kwe:ʔlaʔ	*kwenąʔ
'louse'	*kwe:ʔttyeʔ	*kwitįʔ
'herbaceous plant'	*kiʔxxiʔ	*kisi̯ʔ

Table 4.5: Proto-Chatino words had no more than one glottal stop (E. Campbell, in press)

No prefixes contain glottal stops, and only a few clitics, mostly those involving contractions with the relational noun *jiʔìn*, contain glottal stops. When one of these is at-

one-glottal-stop-per-word limit.

tached to a stem containing a glottal stop, both glottal stops are heard *n-t-akónʔ chóʔ* /n-t-akõʔ^{H}=t͡ʃoʔ^{H}/ → [^{n}dạ̰kõʔtʃoʔ] (C-TR-cover=3.FEM) '(the woman) covered it'.

4.3.2 Constraint against unlike vowels across laryngeal consonants

With the exception of a very small set of words, there are no cases of an intervocalic laryngeal consonant surrounded by unlike vowels, that is $V_1 = V_2$ in nearly every V_1{h,ʔ}V_2 sequence. The only cases where $V_1 \neq V_2$ in a V_1{h,ʔ}V_2 sequence are a few recent loans, namely *^{0}wrajù* /wɾahu$^{0\text{-}L}$/ [βr̥a.hu] 'skirt' < Sp. *refajo* /refaxo/ and *kwnejonʔ* /k^{w}nehõʔ^{X}/ [k^{w}nɛ.hõʔ] 'rabbit'< Sp. *conejo* /konexo/.

Only one native form appears to violate the $V_1 = V_2$ in V_1{h,ʔ}V_2 stipulation. The word *yajan* /jahã^{X}/ [jã.hã] 'year' has the short form *ijan* /ihã^{X}/ [i.hã]. This may be an exceptional form, or else a more abstract analysis of the short form could explain the distinct form of the vowel: the short form could be analyzed not as /ihã^{X}/ as /jhã^{X}/, with /j/ realized as [i] in this context.

4.3.3 Constraint against [+coronal] stop-sonorant sequences

Tataltepec Chatino shows a prohibition against a sequence of a coronal stop followed by a coronal sonorant /tn tl t^{j}n^{j} t^{j}l^{j}/.[17]

Where other Chatino languages exhibit coronals before these sonorants, Tataltepec Chatino features a velar stop instead of the coronal /kl kl^{j} kn kn^{j}/. For example, the word

[17]The flap /ɾ/ is notably absent from this process, and can be found in loans (but not native vocabulary) such as *^{0}mstrù* 'schoolteacher' < Sp. *maestro*, *trí seʔèn* 'intestines' < Sp. *tripas* + excrement, *^{0}tronkkòn* 'bare (as a tree without leaves)' < Sp. *tronco* and *potrankà* 'filly' < Sp. *potranca*.

for 'work, labor', is *tnya*^{32} in Yaitepec Eastern Chatino (Rasch & Suárez Martínez, in press, 496) and *knyá* in Tataltepec Chatino. Another example would be TAT *kloo* /klo:^{X}/ 'face' as compared to ZAC *talōó* 'face'.

Evidence is also found within Tataltepec Chatino verbs. Underlying /tʲ/ surfaces as [k] when vowel syncopation (§ 2.2.2) brings them in contact with a (coronal) lateral in the stem. For example 'H.touch' is formed from /ntʲ-alaʔ^{X}/ and surfaces alternatively as [^{n}dʲa̱laʔ] or [^{ŋ}glʲaʔ]. Contrasts between velar stop-lateral and coronal stop-lateral sequences are rare and a neutralization of velars and coronals in this environment is understandable (Blevins & Grawunder, 2009).

This dissimilation could be explained by a historical rule such as (31).

(31) Pre-Tataltepec *t dissimilates with following coronal sonorant

*t > k / __ [$^{+cor}_{+son}$]

4.3.4 Constraint against glides before corresponding vowels

There is a restriction on glides preceding similar vowels within roots, that is, the palatal glide /j/ does not precede the high front vowels /i ĩ/, and the labiovelar glide /w/ does not precede the back vowels /o u õ/. Interestingly, this restriction does not extend to the voiceless glide /j̥/, as seen in examples such as *tjjyi* /tʲj̥i^{X}/ 'sweet' and *^{0}ntyjyi* /ntʲj̥i$^{0\text{-}X}$/ 'H.be found'. This restriction against glide-vowel sequences at a similar point of articulation is widespread throughout Chatino, and /yi/ and /wu/ sequences are absent from the native non-sound symbolic lexica of ZEN, YAI and ZAC (E. Campbell & Carleton, in press; Rasch & Suárez Martínez, in press; Villard, 2011-2014). This may be a very old Zapotecan restriction as

(Kaufman, 1993-2007) only reconstructs no pZAP *wu sequences and only one pZAP *yi sequence: *yisa 'year'.

4.3.5 Constraint against [+labial] CV sequences

The rounded ([+labial]) vowels /o u õ/ do not follow the labial consonants /b f p k^w m w/ in nearly every native, non-sound symbolic root. A [+labial] CV sequence occurs in precisely one Zapotecan root in TAT: *boʔǒ* /βo̰ʔo/ 'coyote'. This lexeme is also the only exception to this restriction in ZAC (*xonīʔ woʔo* 'coyote', (dog coyote)), which is the only other topolect that preserves the onset, as other Eastern Chatino topolects have syncopated the initial syllable (e.g. YAI *ʔo*^{24}) or has replaced this etymon with another expression (e.g. ZEN *jnēʔ koyotē* (dog coyote) and *jnēʔ kyaʔā* (dog mountain)).[18]

Similar restrictions are observed throughout the Zapotecan branch of Otomanguean. This constraint is also present in the nearby Mixtecan branch of Otomanguean where many Mixtec languages and all Triqui topolects obey a similar restriction against [+labial] CV sequences but allow [+labial] VC sequences (Longacre, 1957; Silverman, 2002).

4.3.6 Constraint against multiple labial consonants

Perhaps related to the prohibition on [+labial] CV is the fact that native roots in Tataltepec Chatino contain at most one [+labial] consonant, with the exception of *memèʔ* /memeʔ^{L}/

[18]Belmar (1902) gives this lexeme as *ohó* (presumably /oʔo/) for Zenzontepec Chatino, suggesting that the restriction on labial sequences may have led to the elimination of the labial onset (much like with TAT ^{0}*urù* < Sp. *burro* 'donkey'), and as *boó* (presumably /woʔo/) for Juquila Eastern Chatino. This lexeme has been reconstructed for Proto-Zapotecan as *(kwe+/ko+)weʔyo (Kaufman, 1993-2007), but a very similar form is observed throughout Mixtec (e.g. San Juan Colorado *ina ndivaahu* /inã̂ ^{n}diβa:ʔú/ (*lit.* dog + coyote) (Sara Stark & Lorenzo Cruz, 1986)) and the Zapotecan etymon may be an early loan from Proto-Mixe-Zoquean *pa·huʔ (L. Campbell & Kaufman, 1976).

'antlion', which may be a loanword. Multiple labial consonants can occur in inflected stems, as with *nkw-lakwán* /nk^{w}-lak^{w}ã^{H}/ (C-bless) 'blessed (adj.)'.

Chapter 5

Tone phonology

Like the rest of the Chatino languages, Tataltepec Chatino makes extensive use of tonal phonology to encode lexical distinctions and inflect verbs for subject and aspect and nouns for possessor. This chapter will explore the details of the phonology of tone in Tataltepec Chatino, first by presenting an overview (§ 5.1) which will describe the surface contrasts seen in Tataltepec Chatino; discuss particulars relating to the association of tone sequences to stems and the uneven distribution of tone sequences across the word classes of Tataltepec Chatino, which will help motivate the analysis of Tataltepec Chatino's level tones as Low, High, and Superhigh rather than Low, Mid, and High. Next, three tone processes which are important to the tone phonology of Tataltepec Chatino (low tone spreading (§ 5.2.1), unlinked tone linking (§ 5.2.2) and a dissimilation sandhi (§5.2.3)) are explained in § 5.2. Then § 5.3 will present each tone sequence in turn, providing examples of words with each tone sequence, and spectrograms and pitch traces of typical examples of each. After the inventory of tone sequences is provided, §5.4 will compare Tataltepec Chatino's tone sequences to those of Zenzontepec Chatino and Eastern Chatino.

5.1 Overview of tone

Tataltepec Chatino has four tones: a low L, a high H, a contour H͡L, and a superhigh 0 tone.[1] These four tones can be arranged in sets of zero to two tones which are called tone sequences. Tone sequences can also differ in whether or not a superhigh tone is linked (and will always surface) or is unlinked and will only surface in particular phonological contexts. The tone sequence, and not the tones themselves, are considered to be part of Tataltepec Chatino lexical representations for a number of reasons. First, only a small subset of the logically possible tone sequences are found. The description given in this paragraph would predict 31 tone sequences if tones could occur freely (considering linked and unlinked superhigh tone separately, there would be 5 one-tone sequences, 25 two-tone sequences, and an empty tone sequence), when only 8 are found. Second, the same tone sequence can be realized differently on words of different phonological shapes, and linked tones always surface, even if multiple tones are forced to surface on a single monomoraic word. Finally, as will be seen more fully in Chapter 9's discussion of verb inflection, the tone sequences function as morphological units and can be substituted for one another in inflection paradigms in ways that would be difficult to explain were each tone expected to occur freely.

The somewhat unusual analysis of the non-contour tones as low, high, and superhigh rather than a typologically more common low, mid, and high is informed by evidence suggesting that the superhigh tone is marginal to the tonal system. Firstly, metalinguis-

[1] The use of zero to represent a superhigh tone is a carryover from earlier tone transcription schemes in which tone was indicated by numerals, where 4 represented the lowest pitch, 3 and 2 represented higher pitches, 1 represented high pitch, and 0 indicated an exaggeratedly superhigh pitch peak.

tic discourse about Tataltepec Chatino treats H and 0 as more similar than L, with both of those being referred to as "high tones" (*tonos altos*). Secondly, the F0 values at the peak of superhigh target is so high that its production borders on falsetto for some speakers. Finally, 0 is a more phonologically marked tone than H, since it is found in unlinked tones and fails to trigger the linking of other unlinked tones. Additionally, as will be discussed in § 5.1.2, the superhigh tone appears to be a derived tone since it occurs mostly in morphologically complex inflected words and is uncommon or rare in simple words of major word classes (§ 5.1.2). A treatment of the three main tone levels as L, M, and H would then presume that the highest tone was derived from an earlier system which had basic tone levels L and M, not L and H as my analysis allows.

Zenzontepec Chatino has also been analyzed as having a typologically uncommon collection of tones. This two-tone language {M H} rather than a more common {L H} (E. Campbell, 2014). Tataltepec Chatino could be analyzed as sharing this typological peculiarity (where the tones are not L and H (and superhigh) but M and H (and superhigh) due to the association of ZEN M tones to TAT L tones, but the synchronic evidence from TAT to motivate reanalyzing the L tone as an M---the L tone is typically only truly phonetically low in phrase-final positions and is most often phonetically mid--is weaker than the language-internal evidence from ZEN.

Tataltepec Chatino's tone system is lexical in that the tone is underlyingly specified and is used to distinguish between lexemes, and is grammatical in that it is also an exponent of person inflection (reflecting possessors of nouns and subjects of verbs) as well as verb aspect inflection. Tone inflection is based on paradigmatic tone substitutions meaning that the observed tone alterations cannot synchronically be explained by the presence

of a single invariant tonal morpheme. An example of a single invariant tonal morpheme would be the Gã perfective or the Ga'anda associative. In Gã, a verb form like *é˥wó* 'he has lifted' is formed from the underlying form /e^{H}-^{L}-wo^{H}/ (SUBJ-PERF-lift) where the unassociated L tone encodes the perfective aspect, and is realized as the downstep (indicated by <˥>) of the H tone of the verb stem. In Ga'anda, the associative is always created by the addition of a floating H tone which replaces the first tone of the noun stem, as when the underlying form /al$^{M\ H}$ cu^{L}ne^{L}wa^{L}/ (bone ASSOC elephant) 'bone of elephant' is realized as *al^{M} cu^{H}ne^{L}wa^{L}* (Kenstowicz, 1994; Ma Newman, 1971).

In contrast, tonal inflection in Tataltepec Chatino involves paradigmatic alternations between the tone sequences of related stems. For example, 'mother(.3)'[2] is *xnyaʔá* /ʃnʲaʔa^{H}/, but when inflected for the second person singular, the word is realized as *xnyaʔā* /ʃnʲaʔa^{M}/ 'your mother'. There are many tonal minimal sets among the inflections of a given stem.

The tone sequences are distributed unevenly throughout the lexicon, in that certain tone sequences are more common in some word classes than in others. The tone sequences are also distributed unevenly according to etymological provenance, with loanwords (chiefly from Spanish, but also Coastal Mixtec) being predominantly of one particular tone sequence.

[2]Being an inherently possessed noun (§ 8.1.2), 'his/her/its/their mother' might be a more accurate, if less succinct gloss. The possibility of interepreting these nouns as having a third-person possessor even in the absence of an overt possessor is represented in glosses by adding '(.3)' after the inherently possessed noun.

5.1.1 The tone sequence

The tone sequence (/0-X/, /0L/, etc.), and not the four tones themselves (L H 0 H͡L), is considered to be part of Tataltepec Chatino lexical representations. First, only a small subset of the logically possible tone sequences are found. The number of tones and the different ways than can be arranged would predict that there would be 31 tone sequences if tones occurred freely, when only 8 are found.[3] Second, the same tone sequence is realized differently on words of different phonological shapes, and the tones of a tone sequence always surface, even if multiple tones are forced to surface on a single monomoraic word. Finally, as will be seen more fully in Chapter 9's discussion of verb inflection, the tone sequences function as morphological units and can be substituted for one another in inflection paradigms in ways that would be difficult to explain were each tone expected to occur freely.

The tone sequence contains between zero and two of Tataltepec Chatino's four tones, one of which (the superhigh tone) may be either linked (meaning it will always surface) or unlinked (in which case it surfaces only in particular contexts). These tone sequences are listed in (1).

[3]If the linked and unlinked superhigh tones are separated, there would be 5 one-tone sequences, 25 two-tone sequences, and 1 empty tone sequence.

(1) Tataltepec Chatino tone sequences

/X/	no linked or unlinked tone, phonologically toneless
/L/	a linked Low tone
/H/	a linked High tone
/0/	a linked superhigh tone
/H͡L/	a linked High-Low contour tone
/0L/	a linked superhigh tone followed by a linked Low tone
/0-X/	an unlinked superhigh tone
/0-L/	an unlinked superhigh tone followed by a linked Low tone

The surface realization of each of these tone sequences depends on the shape of the word to which they are associated. The constituent tones of a tone sequence are realized differently on short, monomoraic monosyllables, on long dimoraic monosyllables, and on dimoraic disyllables. Phonological evidence for an analysis of tones being arranged in tone sequences, which are assigned to words, rather than an analysis where tones are assigned directly to vowels comes from the distribution of tone sequences across different kinds of word shapes and the stability of tone sequences in words which vary between word shapes.

Unlike languages with tones linked to the mora or the vowel, all tone sequences of Tataltepec Chatino can appear on the smallest stems: monosyllabic stems with short vowels as seen in (2). If tones were linked directly to vowels or moras, we would not expect to find the full assortment of tone sequences---particularly /0L/ which is a sequence of two tones---on these small words. In (2), <X> represents the absence of a linked tone, and <0-> represents an unlinked superhigh tone.

(2) Tone sequences on monomoraic stems

/X/	*cha*	/t͡ʃa^{X}/	'sharp'
/0-X/	*^{0}cheʔ*	/t͡ʃeʔ$^{0\text{-}X}$/	'sandy'
/0/	*nă*	/na^{0}/	'NEG'
/L/	*chònʔ*	/t͡ʃõʔ^{L}/	'back'
/0-L/	*^{0}skà*	/ska$^{0\text{-}L}$/	'sugar' < Sp. *azúcar*
/0L/	*^{0}xlyà*	/ʃlʲa^{0L}/	'bread' < Sp. (tortilla) *castellano*
/H/	*chúʔ*	/t͡ʃuʔ^{H}/	'coati'
/H͡L/	*mā*	/ma$^{H\widehat{L}}$/	'where?'

The tones of a tone sequence are assigned to the moras of a word from right to left and are realized distinctly according to the shape of the word (either CV, CV:, or CVCV). An attempt to analyze Tataltepec Chatino as a language with tones linked directly to moras or vowels would result in a great number of tones which can be subsumed under a tone sequence analysis. A previous attempt to treat tone as a property of vowels in Tataltepec Chatino (L. Pride, 1984) will be discussed in §6.3, but note that even while committing himself to linking tone directly to vowels, Pride notes the preponderance of certain surface sequences of tones and notes that only a subset of the combinatorially possible tone sequences are found.

The different ways in which word shape can influence the realization of a single tone sequence is demonstrated in Figure 5.1. Here a single tone sequence /0-L/ (made of an unlinked superhigh tone followed by a linked Low tone) is realized by six different tonal gestures {˩, ˥˩, ↓, ˧˩, ↓, ˥˩} depending on the number and distribution of moras in the word linked to the tone sequence (whether the word's two moras are present in different syllables as in *^{0}kaxù* 'cheese', in one long syllable as in *^{0}ruù* 'rice', or if the word only has one mora like *^{0}skà* 'sugar'), and whether or not the tone sequence of the preceding word either causes the linking of the unlinked superhigh tone (as when the preceding word is /H/-

toned like *nt-akón* (H-eat.1SG) 'I eat') or if no such tone is present (as with the toneless *nt-aku* (H-eat(.3)) 'eats'.

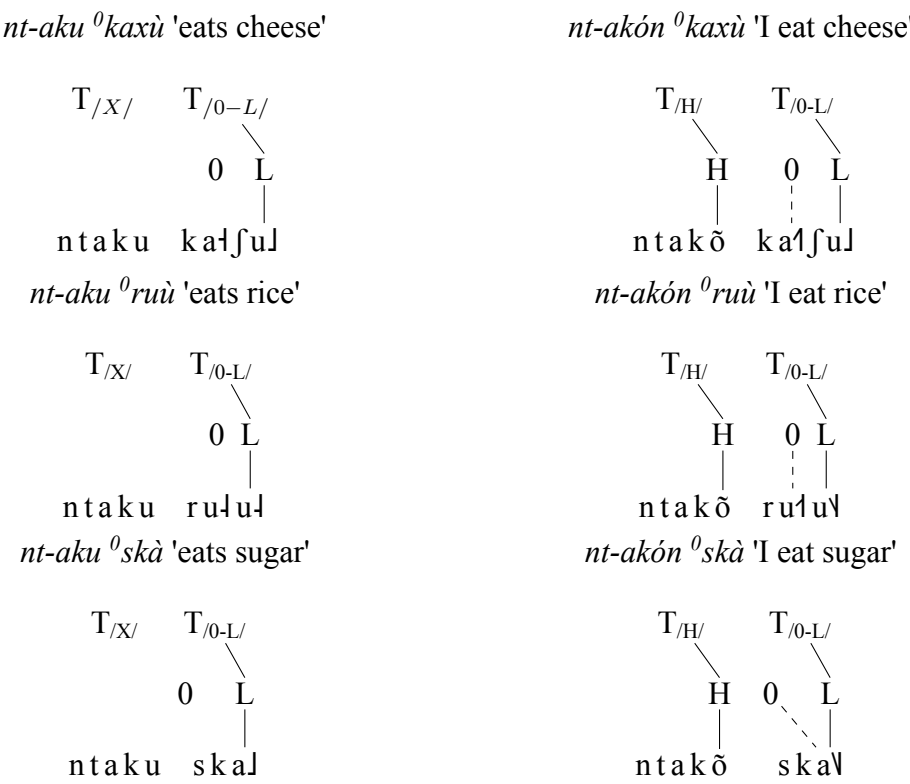


Figure 5.1: Tone sequences are realized distinctly according to the shape of the word

Additional evidence for the unity of the tone sequence comes from the tonal ablaut paradigms (Ch. 8-9) where the tone sequence substitutions are not sensitive to word shape at all.

5.1.2 Distribution of tone sequences

Tone sequences are distributed unevenly throughout the lexicon. As can be seen in Table 5.1, uninflected nouns, adjectives, and verbs (a verb's stem tone is the same as its

tone in the completive aspect) generally belong to one of five tone sequences {X 0-X H L 0-L}. In this Table, a single √ indicates that some instances of the particular tone sequence are found in the given lexical category while a double √√ in a shaded cell indicate that the given tone is particularly common in the lexical category.

		/X/	/0-X/	/H/	/L/	/0-L/	/0/	/0L/	/H͡L/
Nouns	Native	√√	√√	√√	√√	√			
	Borrowed	√	√		√	√√			
Adjectives and Adverbs		√√	√√	√√	√√	√√	√	√	
Numerals				√√		√		√	
Verbs	COMPL	√	√	√√	√√	√			
	PROG	√	√	√√	√		√	√√	√√
	POT/HAB	√	√√	√	√	√√			
Infl.	N/V.2SG						√√		√√
	N/V.1SG	√		√√	√√	√√		√	

Table 5.1: Distribution of tone sequences throughout the lexicon

The coarsest generalization that can be made from Table 5.1 is that words that belong to major lexical categories and are morphologically simple (native nouns, verbs inflected for the completive aspect) generally have one of the tone sequences {X 0-X H L} and sometimes {0-L} whereas words which are morphologically complex such as verbs inflected for a non-completive aspect, or nouns or verbs inflected for person are more frequently of the tone sequences {0 H͡L 0L 0-L 0-X}. I interpret this as evidence that the contour tone H͡L and the superhigh tone (whether linked or unlinked) are marginal to the tone system of Tataltepec Chatino. This observation is part of my motivation for analyzing Tataltepec Chatino's non-contour tones as low, high, and superhigh rather than the typologically more common low, mid, and high.

Borrowed nouns have a different assortment of common tone sequences than native

nouns. Loans (mostly from Spanish but also from Coastal Mixtec) overwhelmingly have tone sequence /0-L/, which is uncommon among native nouns.[4] The tone sequences {0 0L H͡L} are almost entirely absent from the set of nouns, and those nouns which do have one of these tones often appear to be built of old compounds, such as *chuniʔī* /t͡ʃuniʔi$^{\widehat{HL}}$/ 'scorpion', which is likely an old compound. Adjectives and adverbs generally follow the tone sequence distribution patterns of uninflected nouns, though the tone sequence /0/ and /0L/ are more frequent among adjectives and adverbs than among nouns. Numerals are typically of the tone sequence /H/, though some of the higher numeral bases are of tone sequences /0-L/ and /0L/ (which differ only in the linking properties of their superhigh tones)

The uneven distribution of tone sequences is apparent within the aspect inflections of verbs. While verb stems (which has the same tone sequence as the completive aspect) have the tone sequences {X 0-X H L 0-L}, with the most common of these being /H/ and /L/.[5] Verb stems inflected for the progressive aspect show a proclivity for the {H 0L H͡L} tone sequences, and the potential and habitual aspects (which are always of the same tone sequence across Chatino) are more commonly of tone sequences {0-X 0-L}, though {X H L} are also often found.

Verbs and nouns which are inflected for the second person singular (indicating the subject of verbs or the possessor of nouns) are exclusively of the tone sequences {0 H͡L},

[4]This would suggest that this tone sequence was applied to words as they were adopted by Tataltepec Chatino speakers. This process would appear to no longer be productive, as more recent loans from Spanish are entering the language with the tone sequence /X/

[5]This is not to suggest that /H/ and /L/ are especially privileged in the synchronic phonology; /H/ and /L/ in Tataltepec Chatino are each the reflex of two distinct Proto-Chatino tone sequences that have merged in Tataltepec Chatino but remain distinct in Eastern Chatino (§5.4).

and those inflected for the first person singular are generally of tone sequences {H L 0-L}.

5.2 Tone processes

In Tataltepec Chatino, three phonological tone processes can be identified, the spreading of a L tone into a toneless mora (§ 5.2.1), the linking of unlinked superhigh tones in certain contexts (§5.2.2), and a dissimilation process in which the second of two like tones in some circumstances is replaced with a different tone (§5.2.3).

5.2.1 Low tone spreading

An L tone will spread into following toneless moras, as seen in Figure 5.2 where the L tone of *lakeè* 'tomorrow' spreads into the toneless moras of *ty-ee* '(it) finished'. The extent of just how far an L tone may spread has not been established, however as will be seen in § 5.2.2.2 this L tone linking can spread across at least one stem to cause the linking of a unlinked superhigh tone.

lakeè ty-ee (tomorrow P-finish(.3)) 'tomorrow it will finish'

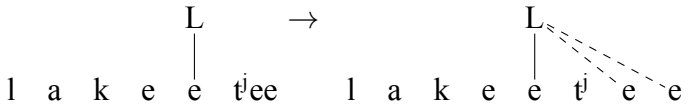


Figure 5.2: L tone spreading

5.2.2 Linking unlinked tones

Two of the phonological tone sequences of Tataltepec Chatino feature an unlinked tone. This unlinked tone, represented by /0-/, is a superhigh tone which is only realized in

particular phonological contexts. In contrast to floating tones identified in other Chatino languages, Tataltepec Chatino's unlinked tone will only ever surface on the same stem it is associated with, and cannot be donated to another stem.

Floating and unlinked tones have been described for many of the world's languages, with many examples coming from African languages like Ga'anda, Gã, East Asian languages such as Cantonese, Mandarin, and Xiamen, as well as other Otomanguean languages of Oaxaca, especially Mixtec languages and Eastern Chatino topolects. Many descriptions of these tones identify only one floating tone (usually a floating H), though systems with multiple floating tones have been described. Hollenbach (2003) describes Santa Magdalena Peñasco Mixtec as having not only the underlying floating H typical of most Mixtec languages, but also a floating L tone found underlyingly on Spanish loans with penultimate stress and derived from the output of other tone sandhi rules. Some descriptions of Eastern Chatino topolects identify multiple levels of underlying floating tones: {MH, H, 0} for Quiahije Eastern Chatino; {L, H, 0} for Zacatepec Eastern Chatino; {LH, H, 0} for Teotepec Eastern Chatino (E. Cruz, 2011; McIntosh, 2012; Villard & Woodbury, 2012). Some floating tones are grammatical in that they are the only phonological exponent of a morpheme rather than part of the phonological representation of various lexemes. One famous example of this is the grammatical floating tone of the associative morpheme in Ga'anda (Kenstowicz, 1994; Ma Newman, 1971), which is a floating H tone that replaces or affects the tone of the following word, as shown in (3).

(3) $al^{M}\ \ ^{H}\quad cu^{L}ne^{L}wa^{L} \rightarrow al^{M}\ \ cu^{H}ne^{L}wa^{L}$
bone ASSOC elephant bone ASSOC.elephant
'bone of elephant' Ga'anda

The label "floating tone" is often used to refer to two potentially distinct types of tones: tones which remain after the (synchronic) deletion of the segments they were originally linked to, and more broadly to tones which are not underlyingly linked to some segment. The first type of floating tone is often the only remaining exponent of some grammatical feature, whereas the second type may only be a consequence of the phonology of the language, and need not interact with a language's morphology. Many of the instances of "floating tone" used in reference to African and Sinitic languages are of the first kind. One example of this first kind of floating tone comes from the northwestern Mandarin language of Nanzhuang. Ma (1990) cites forms of where the deletion of toneless segmental enclitics leads to the lengthening of the preceding vowel and the addition of a falling tone leading to complex tone contours not found elsewhere in the language, as shown in (4). In effect, this leads to Nanzhuang's having a "residual inflectional morphology" (Chen, 2000, 63).

(4) a. *kɯ^{11}-puo kua^{4431} ts'ɛ^{53} liɛ*
arm hang color part
'the arm is bleeding'

b. *kua^{44} liɛ*
hang ASP
'hangs'

Nanzhuang Mandarin

Though the historical development of Chatino tone is not completely understood, the unlinked tone of Tataltepec Chatino does not derive from the deletion of any segmental material, and is therefore a tone which is not underlyingly linked to a segment.

Generally, when tones move, either by spreading or enlarging their domain or drift-

ing independently of the segments they are associated with, they tend to move rightward, so often that this has been put forward as a universal of tone behavior (Cahill, 2008; Hyman, 2007; Hyman & Schuh, 1974). This seems especially true of floating tones, such as the rightward floating tone(s) of Mixtec (Goldsmith, 1990; Hollenbach, 2003; Pike, 1948) which are never linked to the word they are associated with, and the rightward floating tones of Eastern Chatino which either 1) are linked to a following word (though not necessarily the next word) 2) are not linked and fail to surface, or 3) in particular contexts are linked to and surface on the final portion of their associated word (E. Cruz, 2011; McIntosh, 2011; Villard & Woodbury, 2012).

5.2.2.1 Unlinked tones in Chatino

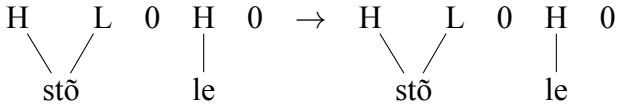
Many Eastern Chatino topolects have been described as having floating tones, though the floating tones of those topolects behave quite distinctly from that of Tataltepec Chatino. Zenzontepec Chatino has no unlinked tones of any kind. The unlinked tones of Tataltepec Chatino behave differently from those of Eastern Chatino topolects in several major ways which will be highlighted here.

Many descriptions of Eastern Chatino topolects, note that multiple tones can be underlyingly unlinked (E. Cruz, 2011; McIntosh, 2015; Villard, 2015). In contrast, Tataltepec Chatino has only one tone which can be unlinked: the superhigh 0. Beyond indicating different pitch targets, the multiple floating tones of Eastern Chatino topolects can also differ from each other in the facts of their linking environments (i.e. in what environments they can surface, and how these surfacing floating tones affect the tones already linked), whereas no such division can be drawn within the unlinked tone of Tataltepec

Chatino. All instances of the unlinked superhigh tone behave the same way.

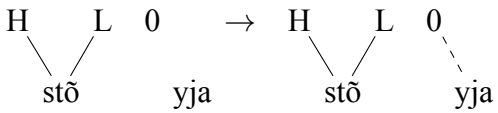
Tataltepec Chatino differs from Eastern Chatino topolects in the ways in which the unlinked tones are realized as well. To pick one topolect as an example, Quiahije Eastern Chatino has a number of possibilities for the realizations of its floating tones. In the following examples, the verb *stõ*$^{\text{HL+0}}$ (P.TR.cut.1IN) 'we will cut' has the tone sequence /HL-0/ meaning it is linked to an H tone and an L tone, and is associated with an unlinked superhigh tone. When placed before certain tone sequences, the unlinked tone may fail to surface, as in (5), but before other sequences it will surface.

stǫ$^{HL+0}$ *le*$^{H+0}$ 'we will cut napkins'

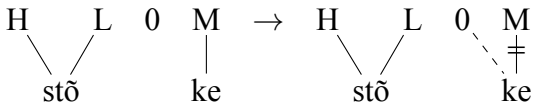
(5) 

Most of the time when the floating tone can surfaces, it appears on the following word. In these cases it either is linked to a phonologically toneless word as in (6) or replaces the tone the following word was originally linked to, as in (7).

stǫ$^{HL+0}$ *yja* 'we will cut tortillas'

(6) 

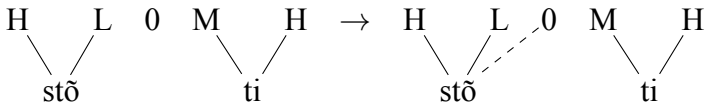
stǫ$^{HL+0}$ *ke*^{M} 'we will cut flowers'

(7) 

Before a few tone sequences, the floating tone is realized not on the following word but

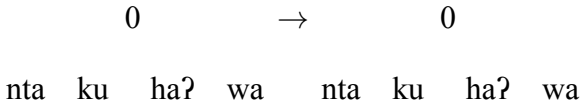
on the word which it is associated with, as in (8).

stǫ$^{HL+0}$ *ti*^{MH} 'we will cut rope'

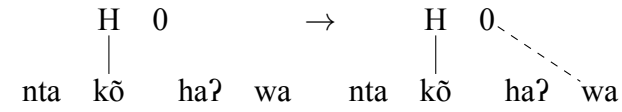
(8) 

While the unlinked tone can also fail to surface in Tataltepec Chatino (as in (9)), and it can add a tone to an unlinked TBU (as in (10)), the linking of the superhigh tone cannot de-link an underlyingly linked tone, and will never surface on the following word--only on the word it is associated with.

nt-aku ^{0}*jaʔwa* 'eats bananas'

(9) 

nt-akón ^{0}*jaʔwa* 'I ate bananas'

(10) 

5.2.2.2 Linking the unlinked tone

The unlinked superhigh tone in the tone sequences /0-X/ and /0-L/ only surfaces if it is preceded by an H or an L tone, including the L present in the /0-L/ and /0L/ tone sequences. Additionally, neither a H͡L, a 0, nor a prosodic boundary may intervene between the unlinked tone and the H or L tone which triggers its appearance. In this regard, the linking of unlinked superhigh tones in Tataltepec Chatino is similar to segmental pro-

cesses such as French *liaison*, where lexically-specified consonants surface in particular phonological environments and do not surface in others according to rules which are partially governed by syntax. In Tataltepec Chatino, the phoneme which surfaces is a tone and not a segment, but like French is lexically specified (historical word-final consonants in French and words with tone sequences /0-X/ and /0-L/ in Tataltepec Chatino). The phoneme surfaces in particular phonological contexts (before an onsetless syllable in French, after an L or H tone in Tataltepec Chatino), though the syntactic environment may preclude the surfacing of the phoneme (i.e. liaison does not occur between an NP and a verb in French, and an H or L tone across certain prosodic boundaries does not cause the linking of the superhigh tone in Tataltepec Chatino).

The unlinked tone is linked after an L, it is not triggered if a tone like H͡L intervenes between the L and the unlinked superhigh tone, (11) where a superhigh floating tone remains unlinked in a sequence of /L H͡L 0-X/-toned words.

lakeè nty-akū ^{0}*jaʔwa* 'today, he is eating bananas'

(11)

	L		H͡L	0				L			H͡L	0		
	|		|					|			|			
lake	e	nt^{j}a	ku		haʔ	wa	→	lake	e	nt^{j}a	ku		haʔ	wa

The H or L tone need not be in the immediately preceding word to trigger the linking of the unlinked superhigh tone. The triggering tone may be separated from the floating tone by one or more stems, and the floating tone will be triggered if these intervening stems are all of the tone sequence /X/. Figure 5.3 shows a spectrogram and pitch trace of the phrase *nteè nttya* ^{0}*bata* /nteː^{L} nt^{j}-t^{j}a^{X} β̤ata$^{0\text{-}X}$/ (LOC:PROX H-bathe cow) 'the cows bathe here'. In this phrase the superhigh tone on ^{0}*bata* is linked (as can be seen by the

sharply rising F0 on its final syllable) because the /L/ tone of *nteè* spreads into the /X/-toned *nttya*, causing this word to be realized with a low level pitch, and causing the linking of the superhigh floating tone. Figure 5.4 provides an autosegmental representation of this [L] spreading and subsequent [0-] linking.

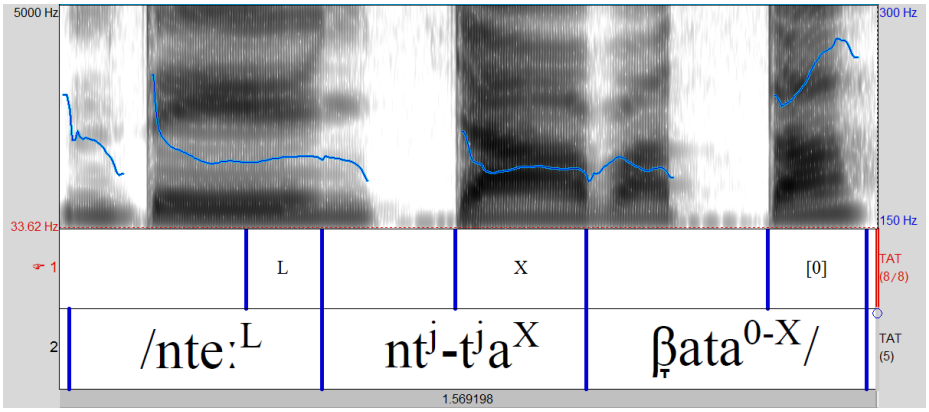


Figure 5.3: Superhigh tone linking in non-adjacent words

nteè nttya ^{0}*bata* 'here the cow bathes'

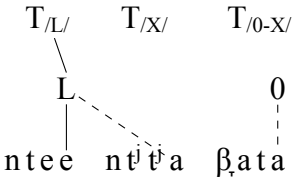


Figure 5.4: A /L/-toned word triggers the linking of a floating tone across a /X/-toned word

There are certain boundaries which block the reach of the floating tone trigger. While the set of all boundaries that block superhigh tone linking have not been explored, sentence junctures are among them.

5.2.3 Tone sandhi

In addition to phenomena surrounding the linking of unlinked tones, another kind of tone change is common in the Chatino languages. In particular environments, a word's tone sequence can be replaced by another in a way that cannot be readily explained by the tonomechanic actions of their constituent tones on one another. These changes are called tone sandhi.[6] Though more common in other topolects, it is relatively rare in Tataltepec Chatino, and has only been identified in one dissimilation process.

When certain words of tone sequence /X/ are placed together, the second of these will change its tone sequence from /X/ to /H͡L/, as in (12). This sandhi process is similar to a process in Quiahije Eastern Chatino in which the second of two adjacent /L/-toned words may optionally mutate into a /+H/ tone sequence, as in (13) (E. Cruz, 2011, 145).

loo yuu 'on the ground'

(12)

$T_{/X/}$	$T_{/X/}$	→	$T_{/X/}$	$T_{/H\widehat{L}/}$	
				$H\widehat{L}$	
l o o	j u u		l o o	j u u	

(13) $ska^{L}\ yu^{L} \rightarrow ska^{L}\ yu^{+H}$

'one dirt' Quiahije Eastern Chatino

It is unclear exactly which /X/-toned words participate in this phenomenon, and further

[6] While others who have written on Chatino have considered all tonal alternations to be tone sandhi, I find the distinction between transparently phonological patterns and more opaque patterns which may be influenced by morphology or syntax to be important and useful for explaining these processes.

investigation may uncover a covert distinction among them,[7] or it may be shown that the dissimilation process is quite old and is restricted to certain lexemes or syntactic arrangements.

5.3 Lexical tone sequences

Tone sequences in Tataltepec Chatino are formed of zero to two tones, the rightmost being of the set {L H͡L H 0} (low, high-low contour, high, and superhigh, respectively) to the left of which a linked or unlinked superhigh tone {0 0-} may appear, which is the same superhigh tone that only differs in whether or not it is underlyingly linked to the stem (§ 5.2.2), as seen in Fig. 5.5, where the tone sequences are provided on schemata representing dimoraic stems.

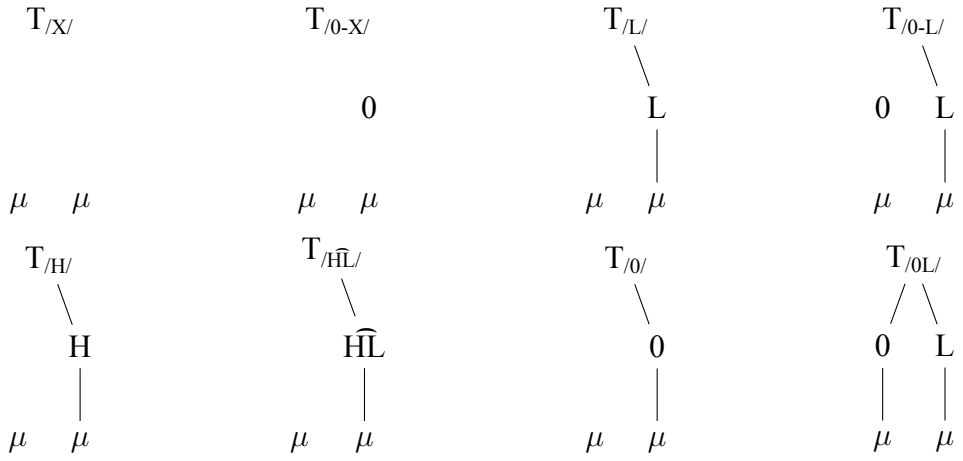


Figure 5.5: Tone sequences consist of zero to two tones

[7]Quiahije Eastern Chatino has two cognates of Tataltepec Chatino's /X/ tone sequence, one which is phonologically toneless and is commonly found on verbs and another which contains only a L tone and is commonly found on nouns.

The remainder of this section will discuss each of these tone sequences in turn.

5.3.1 The null /X/

The most basic tone sequence in Tataltepec Chatino is the null sequence /X/, which contains no tones. This tone sequence (and phonologically and phonetically similar ones elsewhere in Chatino) has been called the "relaxed" (Sp. *relajado*) tone sequence since the mid- or high-to-low fall it often has in citation context gives many listeners the impression that there is less articulatory effort being made to produce a word of this tone sequence than for other tone sequences. The tone sequence is analyzed as lacking any tone because preceding L tones can spread into /X/-toned words, and the superhigh tone linking can occur across a /X/-toned word (§ 5.2.2.2). The absence of a linked tone is represented by a symbol (here <X>, though <∅> is also possible) to avoid having to rely on the absence of a mark to indicate a tone. Some examples of /X/-tone words can be found in (14).

(14) Lexemes of tone sequence /X/

kee	/ke:^{X}/	'stone'
kwalya	/k^{w}al^{j}a^{X}/	'fish'
siʔye	/siʔje^{X}/	'old wood'
tzaan	/t͡sã:^{X}/	'day'
nya	/n^{j}a^{X}/	'griddle'

As seen in the spectrograms and pitch traces of five tokens of *ntaa* /nta:^{X}/ 'bean' given in citation form in Fig. 5.6 (which consists of several utterances spoken by one adult female speaker), F0 generally falls over the course of a word of tone sequence /X/. /CVCV^{X}/ words in isolation are typically realized as [CV^{43}CV^{32}] (CV↰CV↰), /CV:^{X}/ words as [CV:^{42}]

(CV:ɬ), and /CV^{X}/ words as [CV^{32}] (CVɬ).

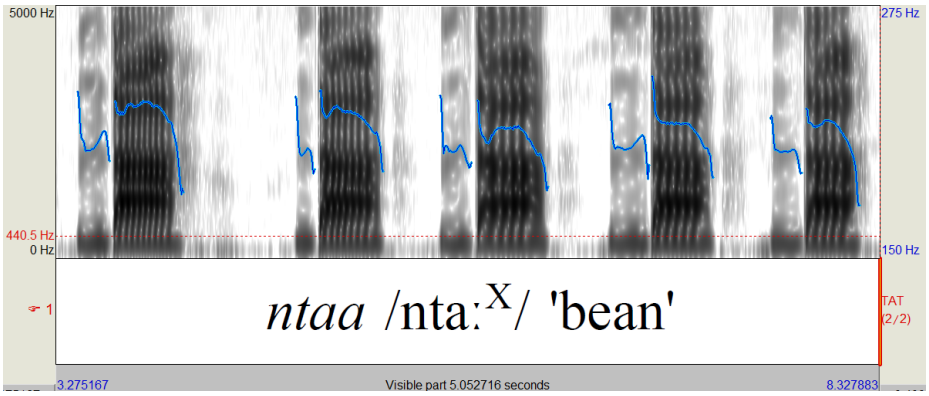


Figure 5.6: Pitch traces of five instances of /X/-toned *ntaa* 'bean'

Figure 5.7 shows a spectrogram and pitch trace of the phrase *nteè nttya kwlyà* ^{0}*ntten* /nte:^{L} nt^{j}-t^{j}a^{X} k^{w}l^{j}a^{L} nttẽ$^{0\text{-}X}$/ (LOC:PROX H.bathe lark) 'the lark bathes here'. The [L] tone of *nteè* spreads into the following vowel, as can be seen by the low pitch level on the short vowel of *nttya* (∼203 Hz.).

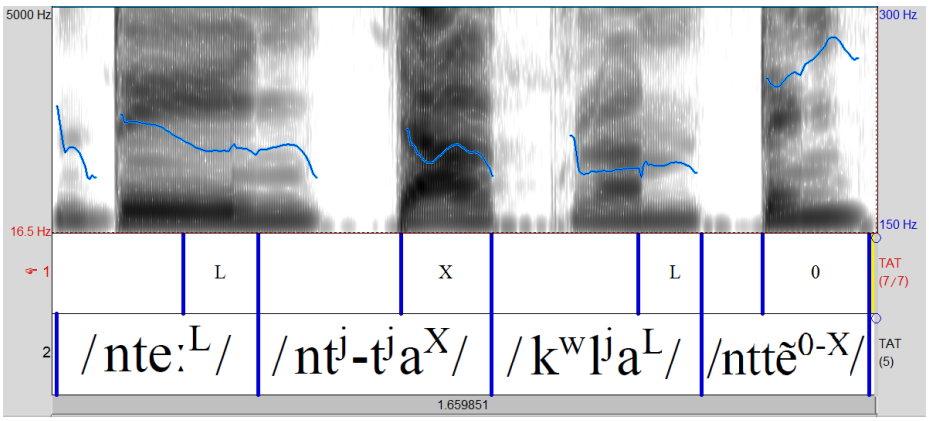


Figure 5.7: Low tone spreads into toneless *nttya*

(15) gives an autosegmental representation of the tonal associations and linkings present in this example. The linked L tones of *nteè* and *kwlyà* are realized on those words, and the

L of *nteè* spreads onto the following toneless word *nttya*. This phrase is also an example of superhigh tone linking (§5.2.2.2) when the linked L of *kwlyà* causes the unlinked 0 of *^{0}ntten* to surface.

nteè nttya kwlyà ^{0}ntten 'the lark bathes here'

(15)

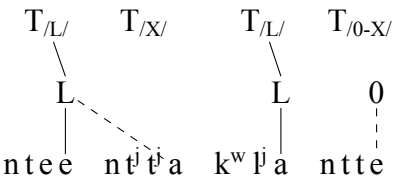


Figure 5.8 shows a spectrogram and pitch trace of the phrase *nakwen ntyata tyunù* /nak^{w}ẽ^{X} nt^{j}-ata^{X} t^{j}unu^{L}/ (say C-bathe prawn) 'they say that the *Macrobrachium* shrimp bathed'. On the prominent syllable of both disyllabic /X/-toned words, F0 falls from a mid-to-high pitch level to a mid-to-low level.

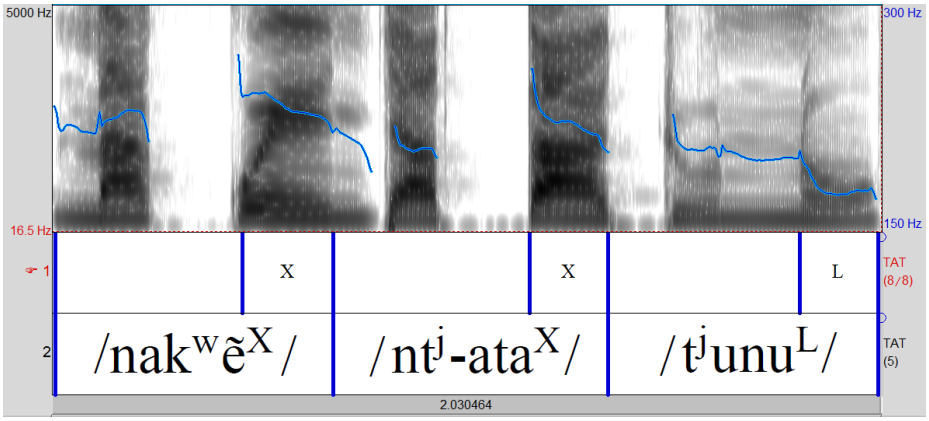
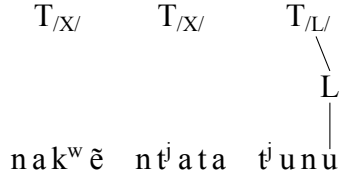


Figure 5.8: Pitch trace of a disyllabic /X/-tone word

(16) is an autosegmental representation of the tone linking and association present in the phrase in Figure 5.8. Here only *tyunù* is linked to a tone.

nakwen ntyata tyunù 'they say the prawn bathed'

(16)



5.3.2 High /H/

The high tone sequence /H/ is represented as the association of a H tone to the right-most mora of a stem. This H tone will cause the linking of a following unlinked super-high tone (§ 5.2.2.2). Words of this tone sequence feature rises in F0 across the duration of the last syllable, or in the last portion of the final syllable's long vowel. /CVCV^{H}/ words in isolation are typically realized as [CV^{2}CV^{24}] (CV˩˥), /CV:^{H}/ words as [CV:^{24}] (CV:˥), and /CV^{H}/ words as [CV^{34}] (CV˥). (17) provides some examples of /H/-tone words.

(17) Lexemes of tone sequence /H/

chúʔ	/t͡ʃuʔ^{H}/	'coati'
kwanyá	/kʷanʲa^{H}/	'snake'
ntaá	/nta:^{H}/	'C.give'
kaʔyú	/kaʔju^{H}/	'five'
kwlixí	/kʷliʃi^{H}/	'butterfly'

Figure 5.9 shows a spectrogram and a pitch trace of a monomoraic /H/-toned word in the phrase *nteè nxná kwlyà ^{0}ntten* /nte:^{L} nʃna^{H} kʷlʲa^{L} nttẽ$^{0\text{-}X}$/ (LOC:PROX G.run lark) 'the lark is running here'. F0 rises over the course of the short vowel of *nxná* from the low level (∼208 Hz.) of this female speaker's range and rises to the high level (∼241 Hz.). Note that the superhigh tone's maximum is markedly higher than the /H/ tone's peak at around 300 Hz.

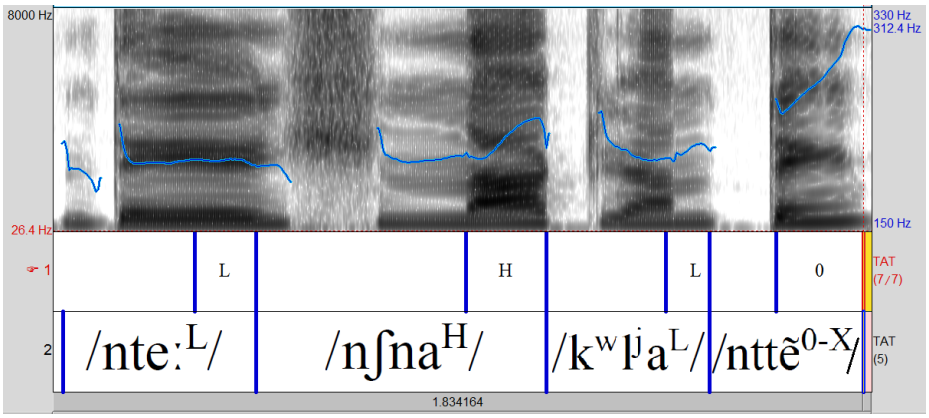


Figure 5.9: Pitch traces of monomoraic /H/-tone word

(18) gives an autosegmental representation of the phrase presented in Figure 5.9. Here *nxná* is linked to an H tone and *nteè* and *kwlyà* are each linked to their respective L tones. The L tone of *kwlyà* serves to bring about the linking of ^{0}*ntten*'s unlinked superhigh tone (§5.2.2.2).

nteè nxná kwlyà ^{0}*ntten* 'the lark is running here'

(18)

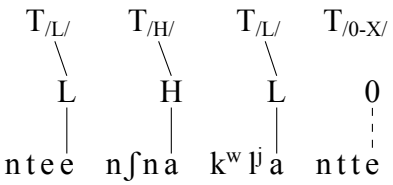


Figure 5.10 shows a spectrogram and pitch trace of the phrase *nteè ntaá kwlyà* ^{0}*ntten* /nte:^{L} nta:^{H} kʷlʲa^{L} nttẽ$^{0\text{-}X}$/ (LOC:PROX C.give lark) 'the lark gave (it) here'. Over the course of the long vowel of *ntaá*, F0 rises gently from a minimum of ∼192 Hz. to a peak of ∼237 Hz.

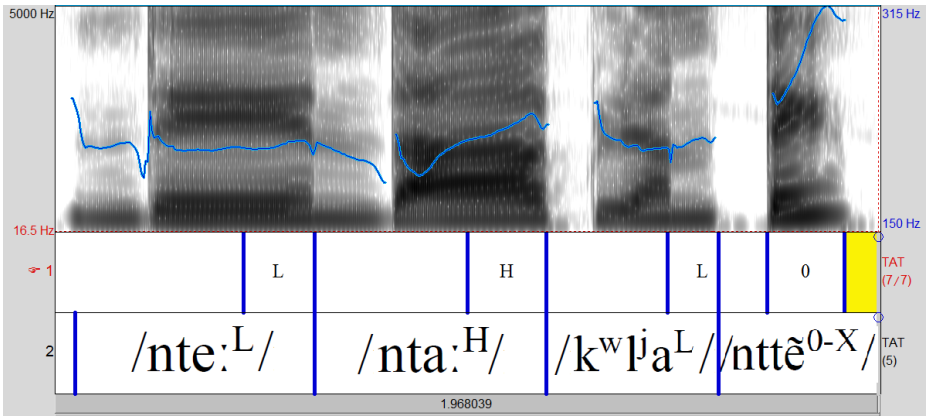


Figure 5.10: Pitch traces of a /H/ word with a long vowel

(19) shows an autosegmental representation of the same phrase. Here *ntaá* is linked to an H tone while *nteè* and *kwlyà* are linked to L tones. The L tone of *kwlyà* causes the linking of the following unlinked superhigh tone (§5.2.2.2).

nteè ntaá kwlyà ^{0}*ntten* 'the lark gave it here'

(19)

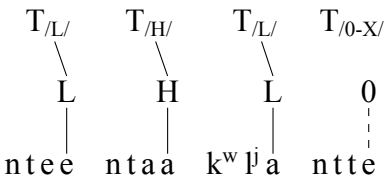


Figure 5.11 shows a spectrogram and pitch trace of the phrase *nteè ntyaná* ^{0}*kwayù* /nte:^{L} nt^{j}-ana^{H} k^{w}aju$^{0\text{-}L}$/ (LOC:PROX C-search horse) 'the horse searched here'. Since the onset of the prominent syllable of *ntyaná* is sonorant, we can see that F0 rises throughout the word, from an F0 minimum of ∼186 Hz. on the penultimate syllable to a peak of ∼228 Hz. on the final syllable. Note that the /H/ tone of *ntyaná* has brought about the linking of the superhigh floating tone of ^{0}*kwayù*.

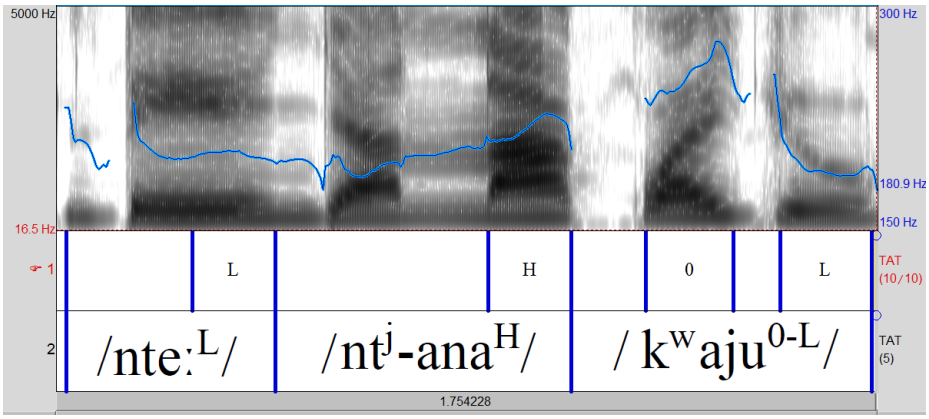
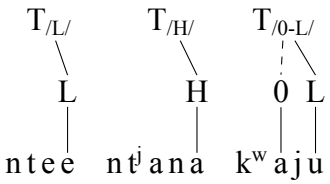


Figure 5.11: Pitch traces an /H/-tone disylabic word

(20) shows the autosegmental representation of the phrase presented in Figure 5.11. Here *nteè* is linked to its L tone, and *⁰kwayù*'s L (which is the linked member of its /0-L/ tone sequence) is also linked to its final mora. An H tone is linked to *nty-aná*, which in turn causes the linking of the unlinked superhigh tone of *⁰kwayù* (§5.2.2.2).

nteè ntyaná ⁰kwayù 'the horse searched here'

(20)



5.3.3 Low /L/

In addition to high tone sequence, Tataltepec Chatino features a low tone sequence /L/. This tone sequence is analyzed as having a L tone linked to the end of a stem. This L tone will cause the linking of a following unlinked superhigh tone (§ 5.2.2.2), and will spread into a following unassociated mora. /CVCV^{L}/ words in isolation are typically real-

ized as [CV^{3}CV^{1}] (CV˧CV˩), /CV:^{L}/ words as [CV:^{23}] (CV:˧˩), and /CV^{L}/ words as [CV^{2}] (CV˧). Typical pitch traces of words of this tone sequence in a citation context can be found in Fig. 5.12, where *ntyunà* /nt^{j}-una^{L}/ (C-hear(.3)) 'heard (it)' represents a typical CVCV /L/-toned word, *nkwlà* /nk^{w}la^{L}/ 'mature' a typical CV /L/-toned word, and *nkwlaà* /nk^{w}-la:^{L}/ (C-release(.3)) 'released (it)' represents a typical CVV /L/-toned word.

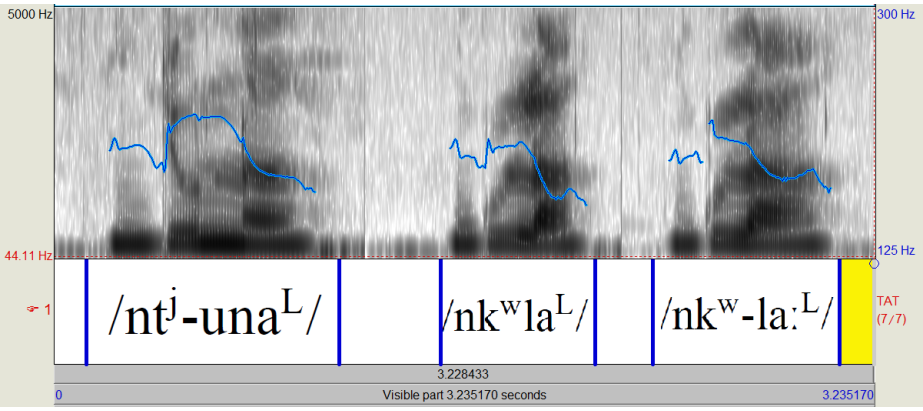


Figure 5.12: Pitch traces of /L/-toned *ntyunà*, *nkwlà*, and *nkwlaà*

Figure 5.13 shows the autosegmental representations of the words in Figure 5.12. In these cases, the L tone is always linked to the last mora of the word, and it is only the differences in the shapes of these words (be them disyllabic like *nty-unà*, with a long vowel like *nkw-laà*, or a short monosyllable like *nkwlà*) which cause the differences in their surface realizations.

(21) lists some examples of /L/-tone words.

nty-unà 'heard (it)' *nkwlà* 'mature' *nkw-laà* 'released (it)'

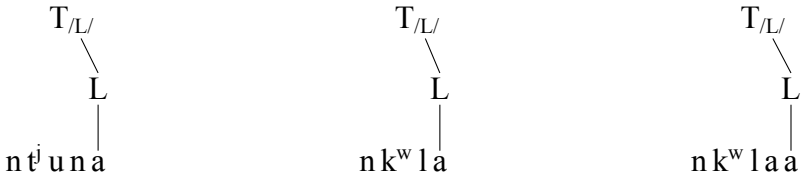


Figure 5.13: /L/ realized on three different word shapes

(21) Lexemes of tone /L/

chiyùʔ	/t͡ʃijuʔ^{L}/	'hummingbird'
xnèʔ	/ʃneʔ^{L}/	'dog'
klyà	/kl^{j}a^{L}/	'deep'
chaʔà	/t͡ʃaʔa^{L}/	'fishy smell'
keè	/ke:^{L}/	'flower'

Figure 5.14 shows a spectrogram and pitch trace of the phrase *nakwen ntyalà kwalya* /nak^{w}ẽ^{X} nt^{j}-ala^{L} k^{w}al^{j}a^{X}/ (say(.3) C-arrive fish) 'they said that the fish arrived'. On the di-syllabic /L/-toned *ntyalà*, the first syllable is in this female speaker's mid-to-low range (∼198 Hz.) and the final syllable is lower with an F0 minimum of ∼172 Hz.

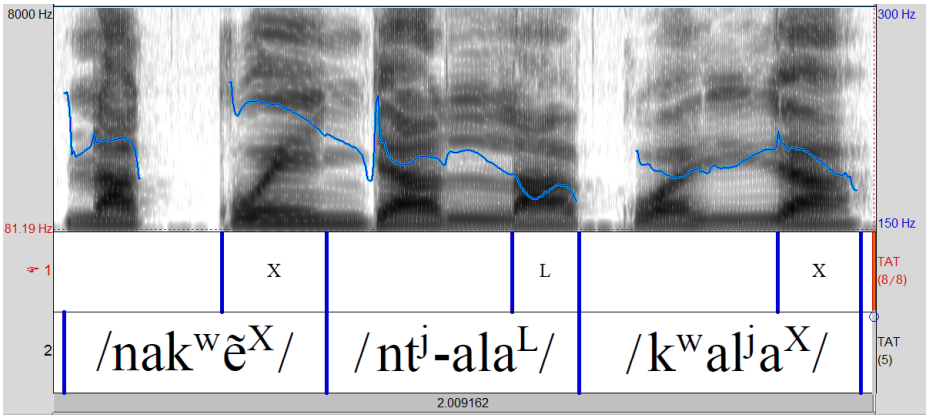
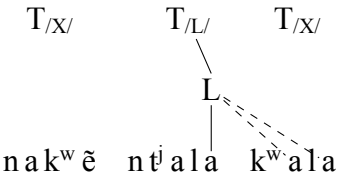


Figure 5.14: Pitch traces of a disyllabic /L/-tone word between two /X/-tone words

(22) is an autosegmental representation of the phrase in Figure 5.14. Here both *nakwen* and *kwalya* are not linked to any tone while *ntyalà* is linked to its L tone on its final mora.

nakwen nty-alà kwalya 'they say that the fish arrived'

(22)



5.3.4 Unlinked superhigh tone /0-X/

There are many words whose surface tone in many contexts is identical to that of the null /X/-tone words, but which have a different realization in other phonological contexts, specifically when preceded by an H or L tone. These words are of tone sequence /0-X/, which, like tone sequence /X/ are not associated with any linked tone, but which are associated to an unlinked superhigh tone 0. When their unlinked tone does not surface (as in isolation context), /0-X/-toned words have an identical tonal realization as a /X/-toned word of the same segmental shape. /CVCV$^{0\text{-}X}$/ words in isolation are typically realized as [CV^{43}CV^{32}] (CV˩CV˩), /CV:$^{0\text{-}X}$/ words as [CV:^{42}] (CV:˩), and /CV$^{0\text{-}X}$/ words as [CV^{32}] (CV˩). When their unlinked tones do surface, /0-X/-toned words have a tonal realization identical to that of a /0/-toned word: /CVCV$^{0\text{-}X}$/ with linked superhigh tones are typically realized as [CV^{2}CV^{25}] (CV˧CV˥), /CV:$^{0\text{-}X}$/ words as [CV:^{25}] (CV:˥), and /CV$^{0\text{-}X}$/ words as [CV^{25}] (CV˥).

Some typical pitch traces of /0-X/-tone words in citation context (and thus with unlinked [0]) can be found in Fig. 5.15, where *^{0}nklya* /nkl^{j}a$^{0\text{-}X}$/ (G.peel(.3)) 'gets peeled' is

an example of a CV word, *⁰nkwloo* /nkʷ-loː$^{0\text{-}X}$/ (C.TR-remove(.3)) 'removed (it)' is an example of an /0-X/-toned CVV word, and *⁰ntuna* /nt-una$^{0\text{-}X}$/ (H-hear(.3)) 'hears (it)' is an example of a CVCV word of tone sequence /0-X/. Note that in these citation forms, the pitch traces of /0-X/-toned words are similar to pitch traces of /X/-toned words in a citation context. As seen in their autosegmental representations in Figure 5.16, each is associated with---but not linked to---a superhigh tone.

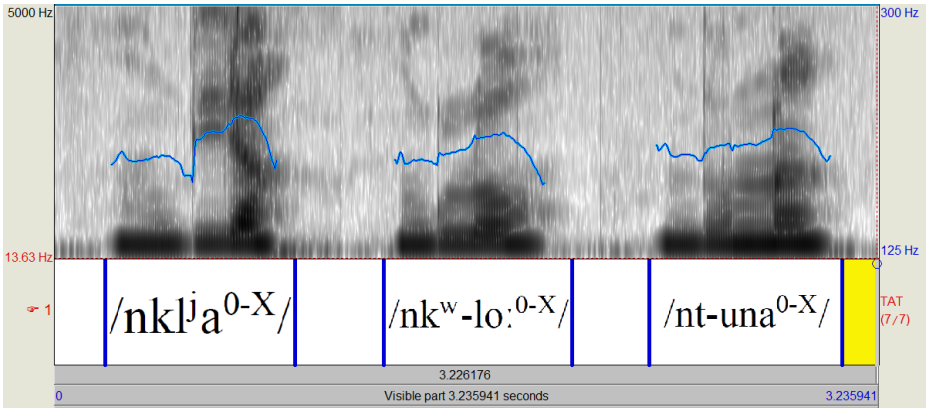


Figure 5.15: Pitch traces of /0-X/-toned *⁰nklya*, *⁰nkwloo*, and *⁰ntuna*

In Figure 5.17, which contains two spliced-together tokens from the same speaker, note that the same lexeme surfaces with two very different F0 melodies depending on its phonological context: *nk-s-⁰aɔwe* 'split' appears with a falling melody on its prominent

nt-⁰una 'hears (it)'	*⁰nklya* 'gets peeled'	*nkw-⁰loo* 'removed (it)'
$T_{/0\text{-}X/}$	$T_{/0\text{-}X/}$	$T_{/0\text{-}X/}$
0	0	0
nt^{j} u n a	n k l^{j} a	n k^{w} l o o

Figure 5.16: /0-X/ realized on three different word shapes

syllable in isolation, but when preceded by the /H/-toned *laká* 'yesterday', *nk-s-*^{0}*aʔwe* exhibits a sharp rise to a superhigh tone on its prominent syllable. This is analyzed as the /H/ tone of *laká* bringing about the linking of the unlinked superhigh tone of *nk-s-*^{0}*aʔwe*, as in (23).

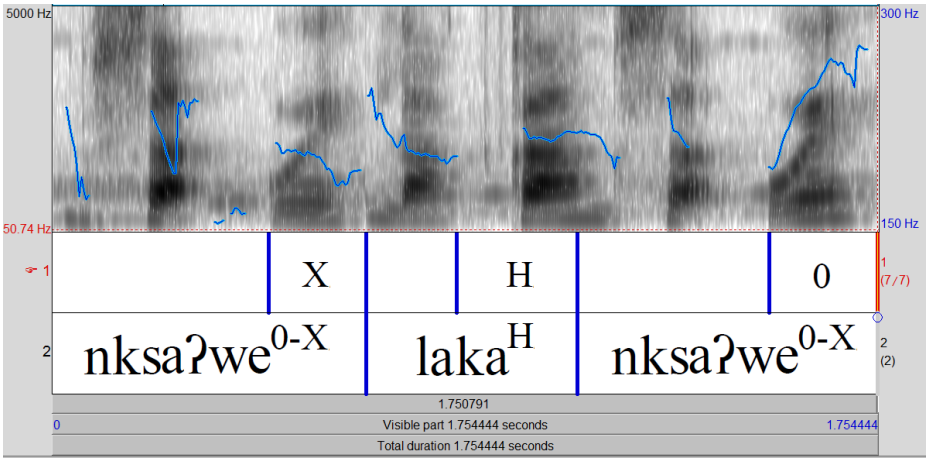
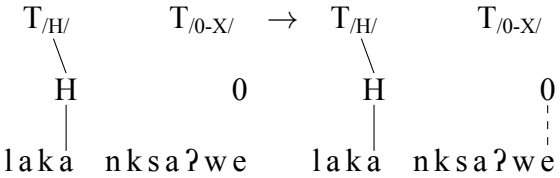


Figure 5.17: A /0-X/-toned word in isolation and after a /H/-toned word

laká nk-s-^{0}*aʔwe* 'yesterday (he) cut (it)'

(23)



(24) lists some examples of /0-X/-tone words.

(24) Lexemes of tone sequence /0-X/

^{0}*nkkon*	/nkkõ$^{0\text{-}X}$/	'turtle'
^{0}*jaʔwa*	/haʔwa$^{0\text{-}X}$/	'banana'
^{0}*ntatzi*	/ntat͡si$^{0\text{-}X}$/	'*nanche*'
^{0}*nkwtu*	/nk^{w}tu$^{0\text{-}X}$/	'century plant stalk'
^{0}*nskee*	/nske:$^{0\text{-}X}$/	'guava'

Figure 5.18 shows a spectrogram and pitch trace of the phrase *jwaʔăn* ^{0}*ntjon* ^{0}*bata* /hwaʔã^{0} nt-hõ$^{0\text{-}X}$ bata$^{0\text{-}X}$/ (thus H-spin_thread cow) 'the cow spins thread in this way'. Over the course of the short vowel of ^{0}*ntjon*, F0 gently falls from ∼234 Hz (in the mid-to-high portion of this female speaker's range) to ∼198 Hz, which is in the low portion of this speaker's range.

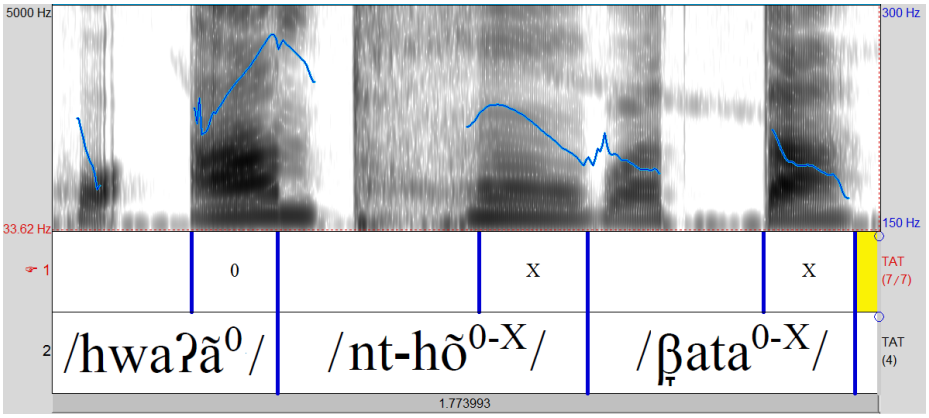


Figure 5.18: Pitch traces of a [X]-tone /0-X/ word

(25) shows the autosegmental representation of the phrase in Figure 5.18. Here all of these words are associated with superhigh tones, though only *jwaʔăn* is linked to its 0. Both *nt-*^{0}*jon* and ^{0}*bata* are not linked to their superhigh tones, and in the absence of another tone which will cause its linking (§5.2.2.2), their superhigh tones are not realized.

jwaʔăn nt-^{0}*jon* ^{0}*bata* 'the cow spins thread in this way'

(25)

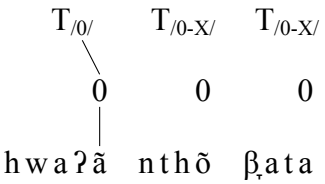


Figure 5.19 shows a pitch trace and spectrogram of the phrase *jwaʔăn nkw-*^{0}*laʔa kwanyá*

/hwaʔã^{0} nk^{w}-laʔa$^{0\text{-}X}$ k^{w}an^{j}a^{H}/ (thus H.TR-split snake) 'the snake splits (it) like this'. Since the floating /0-/ tone has not been linked, the F0 of *^{0}nkwlaʔa* falls over the course of the word's prominent vowel from ∼227 Hz. to a low of ∼189 Hz.

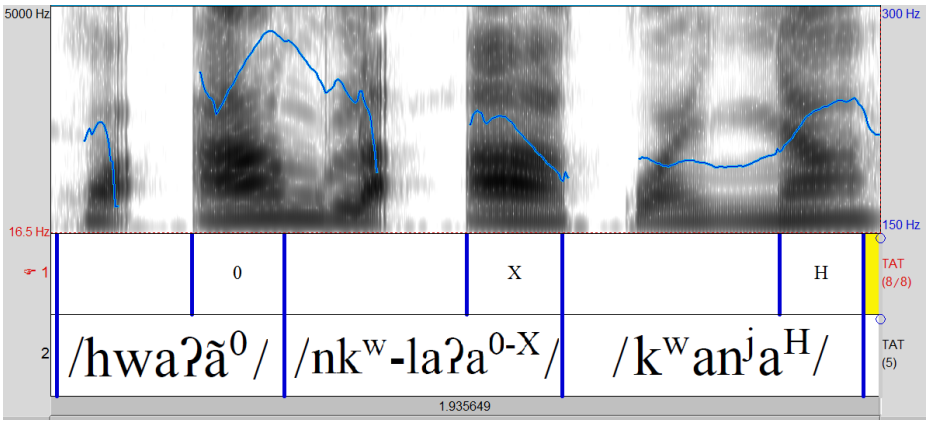


Figure 5.19: Pitch traces of a [X]-tone /0-X/ disyllabic word

(26) gives the autosegmental representation of the phrase in Figure 5.19. Here *jwaʔăn* and *kwanyá* are linked to their respective tones (0 and H) but *nkw-^{0}laʔa* is not linked to its superhigh tone since it is only associated with it, and there is no preceding tone to bring about superhigh tone linking.

jwaʔăn nkw-^{0}laʔa kwanyá 'the snake splits (it) like this'

(26)

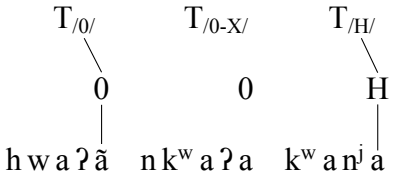


Figure 5.20 shows a spectrogram and pitch trace of the phrase *nteè ^{0}nyaʔa kwalya* /nte:^{L} n^{j}aʔa$^{0\text{-}X}$ k^{w}al^{j}a^{X}/ (LOC:PROX P.see fish) 'the fish will see here'. In this figure, we see that the floating superhigh tone of *^{0}nyaʔa* has been linked due to the /L/-toned word

preceding it, and thus we can see that the F0 gesture of *⁰nyaʔa* is now one of a sharp rise to an F0 maximum at ~282 Hz.

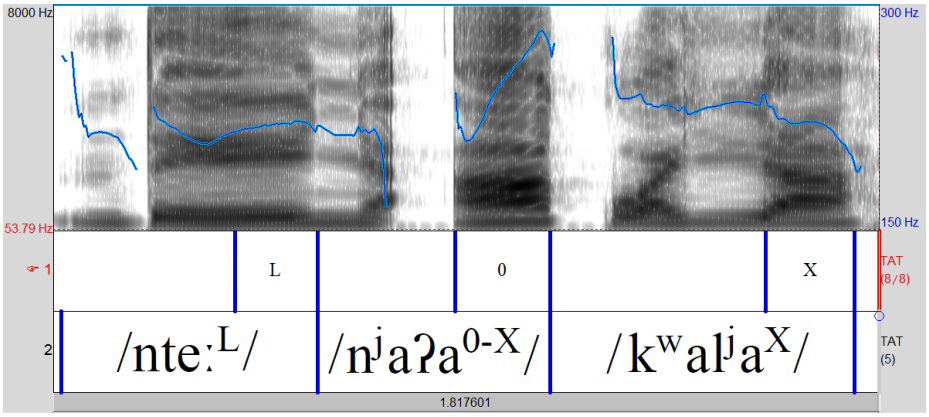
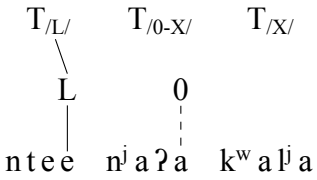


Figure 5.20: Pitch traces of a [0]-tone /0-X/ word

(27) shows the autosegmental representation of the phrase in Figure 5.20. Here *nteè* is linked to its L tone which brings about the linking of the superhigh tone of *⁰nyaʔa*. *Kwalya* is associated and linked to no tone.

nteè ⁰nyaʔa kwalya 'the fish will see here'

(27)



5.3.5 Low with unlinked superhigh tone /0-L/

Just like how /X/-toned words and /0-X/-toned words have similar F0 gestures in some phonological contexts but quite different gestures in others, /L/-tone words have similar F0 movements as /0-L/-tone words in some contexts but quite different F0 move-

ments in others (i.e. after {H L 0-L 0L}). The /0-L/-tone stems are analyzed as being associated with a linked /L/ tone like the /L/-tone words, but also are associated with an unlinked superhigh tone like /0-X/-tone words are. Its final L tone will cause the linking of a following unlinked superhigh tone and can spread into a following unassociate mora. When the /0-L/ tone sequence's unlinked tone does not surface (as in isolation context), /0-L/-toned words have an identical tonal realization as a /L/-toned word of the same segmental shape. /CVCV$^{0\text{-}L}$/ words in isolation are typically realized as [CV^{3}CV^{1}] (CV˧CV˩), /CV:$^{0\text{-}L}$/ words as [CV:^{23}] (CV:˨˧), and /CV$^{0\text{-}L}$/ words as [CV^{2}] (CV˧). When their unlinked tones do surface, /0-L/-toned words have a tonal realization identical to that of a /0L/-toned word: /CVCV$^{0\text{-}L}$/ with linked superhigh tones are typically realized as [CV^{25}CV^{2}] (CV˨˦CV˧), /CV:$^{0\text{-}L}$/ words as [CV:^{352}] (CV:˩˦˨), and /CV$^{0\text{-}L}$/ words as [CV^{51}] (CV˥˩). (28) lists many words belonging to tone sequence /0-L/.

(28) Lexemes of tone sequence /0-L/

^{0}nyatèn	/n^{j}atẽ$^{0\text{-}L}$/	'person'
^{0}ksùʔ	/ksuʔ$^{0\text{-}L}$/	'old'
kiiʔ ^{0}ntywiì	/ki:ʔ^{X} nt^{j}-wi:$^{0\text{-}L}$/	'firefly'
^{0}klyà	/kl^{j}a$^{0\text{-}L}$/	'morning'
^{0}jakwà	/hak^{w}a$^{0\text{-}L}$/	'cloth belt (*soyate*)'

The melody of a /0-L/-tone lexeme varies depending on its phonological context. Specifically, an /H/ or /L/ tone formative will cause the linking of a following unlinked superhigh tone, as in (29), where *^{0}taà* /∅-ta:$^{0\text{-}L}$/ (P-give(.3)) 'will give', a /0-L/-toned word appears similar to a /L/-toned word following the /0/-toned *nǎ* /nã^{0}/ 'NEG', but after *lakeè* /lake:^{L}/ 'tomorrow', a /L/-toned word, the superhigh tone is linked, making *^{0}taà* have a surface form similar to /0L/-tone words.

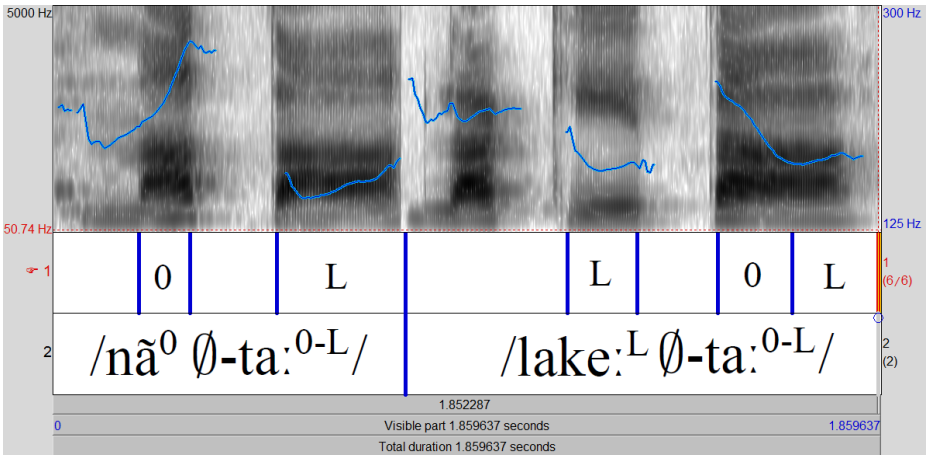


Figure 5.21: Pitch traces an /0-L/-tone word in two contexts

lakeè ^{0}*taà* 'tomorrow (she) will give (it)'

(29)

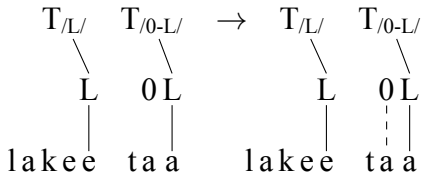


Figure 5.22 shows an example of a monomoraic [L]-tone word in a spectrogram and pitch trace of the phrase *jwaʔǎn* ^{0}*nkjlyà kwanyá* /hwaʔã^{0} nk-hlʲa$^{0\text{-}L}$ kʷanʲa^{H}/ (thus H-play snake) 'the snake plays like this'. The ∼176 Hz. F0 plateau is near the bottom of this female speaker's pitch range. Note also that the phonetic low tone of ^{0}*nkjlyà* spreads into the penultimate (and tonally unspecified) syllable of *kwanyá*.

(30) shows an autosegmental representation of the phrase in Figure 5.22. Here each word is linked to its tone, but the unlinked superhigh tone of *nk-*^{0}*jlyà* fails to surface since it is not preceded by a tone capable of causing the linking of this associated tone.

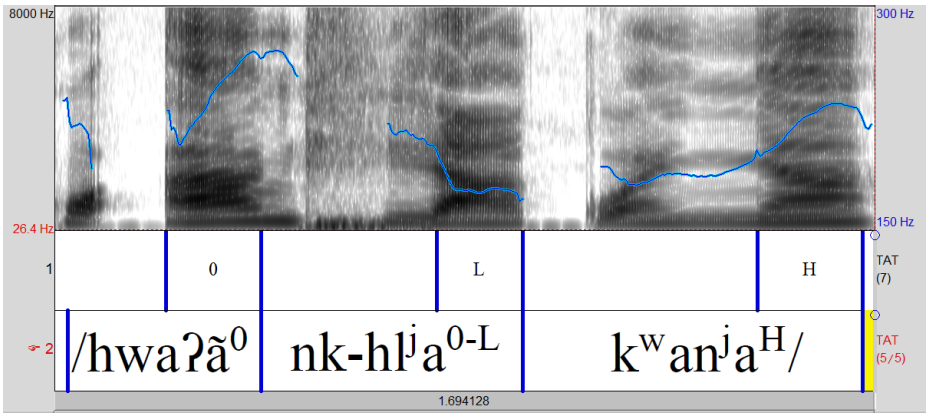


Figure 5.22: Pitch traces of monomoraic /0-L/-tone word

jwaʔăn nk-^{0}jlyà kwanyá 'the snake plays like this'

(30)

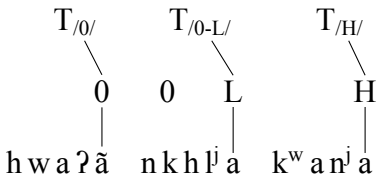


Figure 5.23 shows a spectrogram and pitch trace of the phrase *nteè kw-^{0}lajà tyunù* /nte:^{L} kʷ-laha$^{0\text{-}L}$ tʲunu^{L}/ (LOC:PROX P.TR-sweep prawn) 'here the *Macrobrachium* shrimp will sweep (it).' Note that the unlinked superhigh tone of the /0-L/ tone sequence is linked by virtue of *kw-^{0}lajà* following a /L/-toned word, and as a result, F0 rises sharply to a superhigh level during the penultimate vowel, and fall to a low minimum during the second vowel. F0 rises near the end of the ultimate vowel of *kw-^{0}lajà*, most likely to rise to the mid-level target of the penultimate vowel of the /L/-toned *tyunù*.

(31) shows an autosegmental representation of the phrase in Figure 5.23. Here all three words are linked to L tones, and the L tone of *nteè* causes the linking of the unlinked superhigh tone associated with the /0-L/-toned *kw-^{0}lajà*.

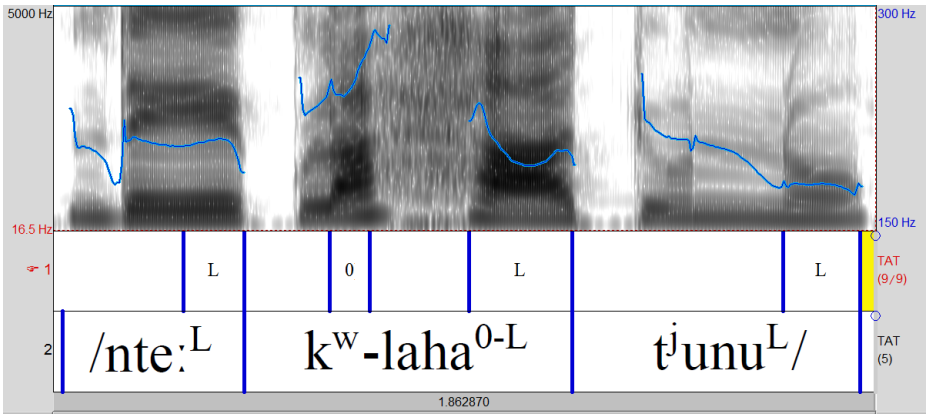


Figure 5.23: A [0L] realization of a disyllabic /0-L/-toned word

nteè kw-⁰lajà tyunù 'the prawn will sweep (it)'

(31)

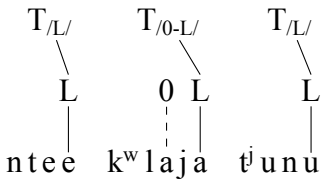


Figure 5.24 shows a spectrogram and pitch trace of the phrase *nteè ⁰nklyaà ⁰bata* /nte:L nkʲa:0-L bata0-X/ (LOC:PROX H.INTR.release cow) 'the cow escapes here'. By virtue of following a /L/-toned word, the unlinked superhigh tone of *⁰nklyaà* is linked to the first mora of the vowel, and is realized as a fall from a superhigh level to a low level, where the F0 remains for the second half of the vowel, as a low tone is already associated with the final mora of *⁰nklyaà*. This low tone also spreads into the penultimate syllable of the following word, whose final syllable exhibits the superhigh rise of its now-linked super-high tone.

(32) shows an autosegmental representation of the phrase in Figure 5.24. Here the L tones of *nteè* and *⁰nklyaà* are linked to the last mora of each word, and the L tone of *nteè*

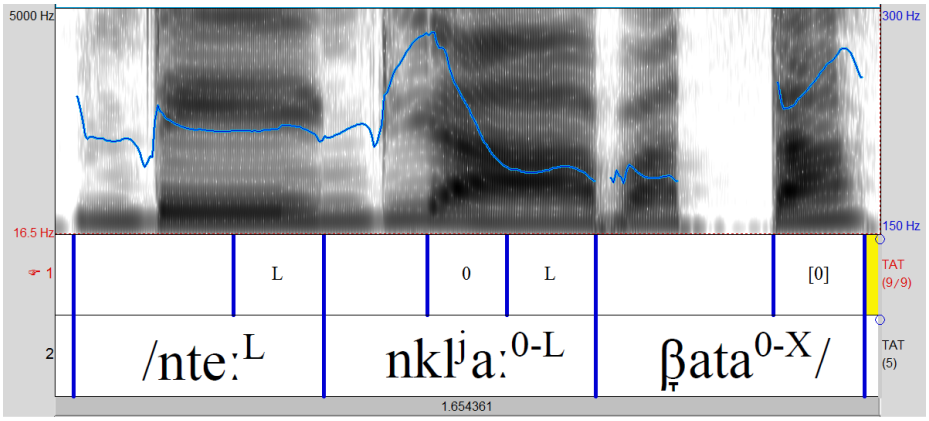


Figure 5.24: Pitch trace of a [0L] toned realization of a long-voweled /0-L/ word

causes the linking of the unlinked superhigh tone associated with *⁰nklyaà*. The L tone of *⁰nklyaà* in turn causes the linking of the unlinked superhigh tone associated with *⁰bata*.

nteè ⁰nklyaà ⁰bata 'the cow escapes here'

(32)

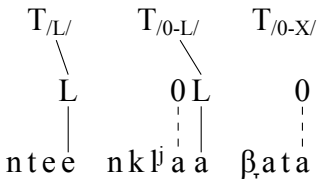


Figure 5.25 shows a spectrogram and pitch trace of the phrase *nakwen ⁰jlyà kwanyá* /nakʷẽˣ ∅-hlʲa0-L kʷanʲaᴴ/ (say P-water snake) 'they say the snake will water (it).' Note that the unlinked superhigh tone of the /0-L/ tone sequence is not linked since *⁰jlyà* follows a /X/-toned word, and as a result, F0 rises gently over the course of the vowel at a low level (∼180 Hz.).

(33) shows the autosegmental representation of the phrase in Figure 5.25. Here the L tone of *⁰jlyà* and the H tone of *kwanyá* are linked, and *nakwen* is neither linked nor asso-

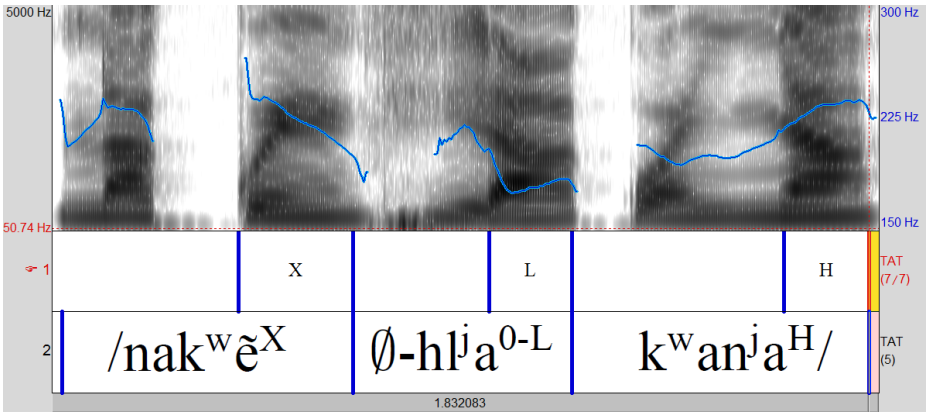


Figure 5.25: A [L] realization of a short monosyllabic /0-L/-toned word

ciated with any tone. Since no tone precedes the unlinked superhigh tone associated with *⁰jlyà*, the superhigh tone remains unlinked and is not realized.

nakwen ⁰jlyà kwanyá 'they say the snake will water (it)'

(33)

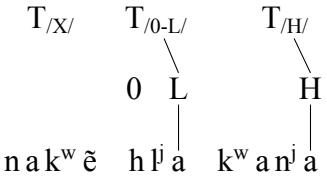


Figure 5.26 shows a spectrogram and pitch trace of the phrase *jwaʔǎn ⁰nyaà ⁰kwayù* /hwaʔã⁰ nʲaː⁰-L kʷaju⁰-L/ (thus be_named horse) 'the horse is called like this'. In this figure, note the low (∼180 Hz.) F0 plateau over most of the long vowel of *⁰nyaà*, which ends like many [L]-toned words with long vowels in a short rise (though in this instance, the rise is likely movement in anticipation of the superhigh peak in the following syllable of *⁰kwayù*).

(34) shows the autosegmental representation of the phrase in Figure 5.26. Here the L tones of *⁰nyaà* and *⁰kwayù* are both linked, and the L tone of *⁰nyaà* causes the linking of

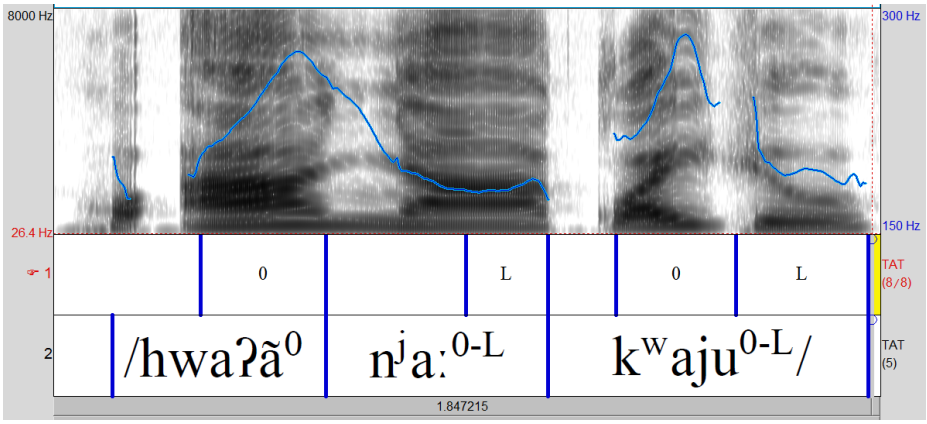
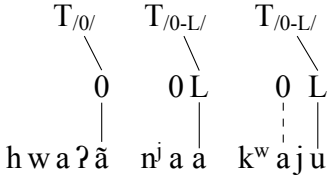


Figure 5.26: Pitch traces of a [L] realization of a dimoraic /0-L/-tone word

the unlinked superhigh tone associated with *⁰kwayù*. The unlinked tone associated with *⁰nyaà* does not surface since the tone preceding it (the superhigh tone linked to *jwaʔǎn*) is not one of the tones that trigger superhigh tone linking.

jwaʔǎn ⁰nyaà ⁰kwayù 'the horse is called like this'

(34)



5.3.6 HL contour /H͡L/

A much less common tone sequence in the language (as was discussed in § 5.1.2), is the high-low contour tone sequence /H͡L/. The "high-low" label is somewhat inadequate, as the F0 gesture of this tone sequence is not a simple fall from a high level to a low level. /CVCV$^{H\widehat{L}}$/ words in isolation are typically realized as [CV^{3}CV^{43}] (CV˦CV˩), /CV:$^{H\widehat{L}}$/ words as [CV:^{343}] (CV:˧˩), and /CV$^{H\widehat{L}}$/ words as [CV^{43}] (CV˩). /H͡L/-toned words

also tend to be produced with shorter vowel durations than words of other tone sequences, and have an impression of being produced more "forcefully". Because of its up-and-down pitch movement in many realizations, one speaker I worked with described the H͡L tone as the "round tone" (*tono redondo*) (Flavia Mateo, p.c. 2011). /H͡L/-tone words do not cause unlinked tone linking and do not spread into toneless stems. Words of these tone sequences are distinct from /X/-toned words in that their realization is much less context-dependent--that is, /H͡L/-toned words will have the same (rising-)falling contour regardless of the immediate tonal context. Additionally, they are typically produced with a shorter duration and seem to be produced with greater articulatory effort.

There is some comparative evidence and synchronic evidence from Tataltepec Chatino inflectional patterns to suggest that the H͡L tone sequence may be the result of a fusion of two earlier tones. /H͡L/ is quite limited in its distribution, but is one of the most common tone sequences for inflected forms (especially stems inflected for second person (where only /H͡L/ and /0/ occur) or third-person progressive aspect verb stems), and the exponents of these morphological categories in other some other Chatino languages are formed of two tonal formatives, as in the /MM/ tone sequence of Zenzontepec Chatino which only occurs in second-person forms, and traces a high-to-mid pitch pattern not entirely dissimilar from Tataltepec Chatino's /H͡L/ (E. Campbell, 2014, 112).

(35) lists some of the /H͡L/-tone words in the lexicon.

(35) Lexemes of tone /H͡L/

ntyakū	/nt^{j}-aku$^{H\widehat{L}}$/	'G-eat'
loʔō	/loʔo$^{H\widehat{L}}$/	'with.2SG'
yeʔē	/jeʔe$^{H\widehat{L}}$/	'green, immature'
klyoō	/kl^{j}o:$^{H\widehat{L}}$/	'first'
chuniʔī	/t͡ʃuniʔi$^{H\widehat{L}}$/	'scorpion'

Figure 5.27 shows some pitch traces of typical examples of /H͡L/-tone words in a citation context. *nkwlā* /nk^{w}-la$^{H\widehat{L}}$/ (C-be_born.2SG) 'you were born' represents a common /H͡L/-toned CV word, *ntyeē* /nt^{j}e:$^{H\widehat{L}}$/ 'you finished' typifies a CVV /H͡L/-toned word, and *ntyunā* /nt^{j}-una$^{H\widehat{L}}$/ (C-cry.2SG) 'you cried' represents a typical CVCV /H͡L/-toned word.

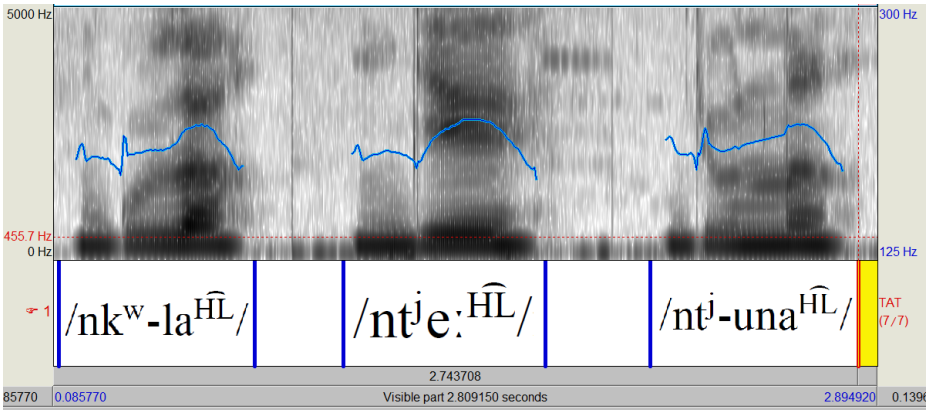


Figure 5.27: Pitch traces of /H͡L/-toned *nkwlā*, *ntyeē*, and *ntyunā*

Figure 5.28 shows the autosegmental representations of the words in Figure 5.27. In each of these words, the H͡L tone is linked to the final mora of the word.

Figure 5.29 shows a spectrogram and pitch trace of the phrase *nteè ntyalā* ^{0}*bata* /nte:^{L} nt^{j}-ala$^{H\widehat{L}}$ bata$^{0\text{-}X}$/ (LOC:PROX G-be_born cow) 'here the cows are being born'. On the penultimate syllable of the /H͡L/-toned *ntyalā* F0 rises from a mid-to-low level (∼221 Hz.) to a high level (∼241 Hz.), and the pitch remains at this high level for the final syllable. De-

nty-unā 'you cried' *nkw-lā* 'you were born' *nty-eē* 'you finished'

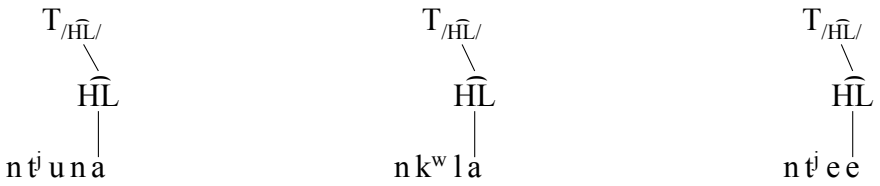


Figure 5.28: /H͡L/ realized on three different word shapes

spite the relatively high phonetic level, and the presence of a /L/-toned word earlier in the phrase, the unlkined superhigh tone of the /0-X/-toned word ^{0}*bata* remains unlinked, and the word is realized with a falling relaxed pitch gesture.

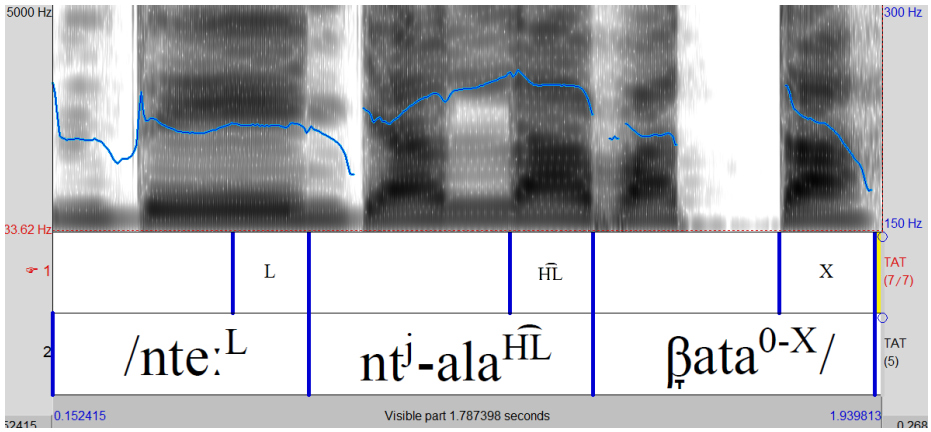


Figure 5.29: The /H͡L/-tone in a disyllabic word

(36) shows an autosegmental representation of the phrase in Figure 5.29. Here the L tones and the H͡L tones are respectively linked to the final moras of *nteè* and *nty-alā*, and the unlinked superhigh tone associate with ^{0}*bata* does not surface. Note that even though an L tone (which normally triggers superhigh tone linking) does not cause the linking of ^{0}*bata*'s unlinked tone since a non-null, non-triggering tone (H͡L) intervenes between the

two tones.

nteè nty-alā ^{0}*bata* 'here the cows are being born'

(36)

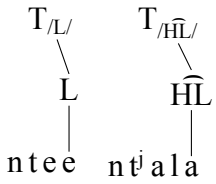


Figure 5.30 shows a spectrogram and pitch trace of the phrase *nteè nktyī* ^{0}*kwayù* /nte:^{L} n-kt^{j}i$^{H\widehat{L}}$ k^{w}aju$^{0\text{-}L}$/ (LOC:PROX G.TR-dry horse) 'the horse is drying (it) here'. Short monosyllabic /H͡L/-toned words like *nktyī* generally have a higher F0 than dimoraic /H͡L/-toned words, and F0 falls over the course of the short syllable from a superhigh level (∼270 Hz.) to a high level (∼240 Hz.). Despite having a /L/-toned word earlier in the phrase, the unlinked superhigh tone of ^{0}*kwayù* does not link and that word is realized as a [L]-toned word rather than a [0L]-toned word.

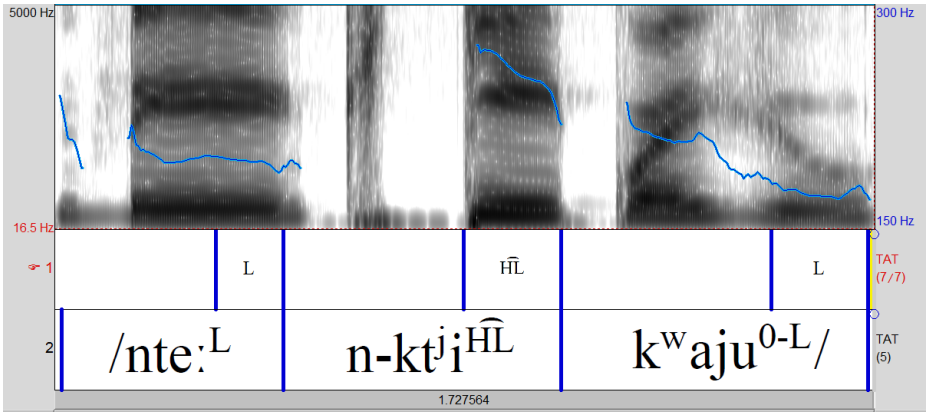


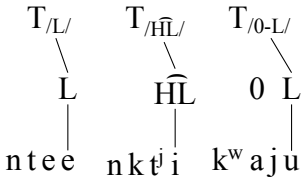
Figure 5.30: The /H͡L/-tone in a disyllabic word

(37) shows an autosegmental representation of the phrase in Figure 5.30. The final moras of both *nteè* and ^{0}*kwayù* are linked to their respective L tones, and *n-ktyī* is linked

to its H͡L tone. Note that even though an L tone (which normally triggers superhigh tone linking) does not cause the linking of *⁰kwayù*'s unlinked tone since a non-null, non-triggering tone (H͡L) intervenes between the two tones.

nteè n-ktyī ⁰kwayù 'here the horse dries'

(37)



5.3.7 Superhigh /0/

Another relatively uncommon tone sequence is the superhigh tone represented as the linking of the rising /0/ tone. /CVCV⁰/ words in isolation are typically realized as [CV²CV²⁵] (CV˩˥CV˥), /CV:⁰/ words as [CV:²⁵] (CV:˥), and /CV⁰/ words as [CV²⁵] (CV˥).

(38) gives some of the /0/-tone words in the lexicon.

(38) Lexemes of tone sequence/0/

nă	/na⁰/	'NEG'
tykă	/tʲka⁰/	'barely'
teěnʔ	/tẽːʔ⁰/	'wrinkled'
nklyoŏ	/nklʲoː⁰/	'G.TR.take out'
tzoʔŏ	/t͡soʔo⁰/	'good'

Figure 5.31 shows some pitch traces of typical utterances of /0/-tone words in isolation. CV words are represented by *nttyă* /ntʲ-tʲa⁰/ (H-bathe.2SG) 'you bathe', CVV words by *nkwloŏ* /nkʷ-loː⁰/ (C.TR-remove.2SG) 'you removed (it)', and CVCV words by *nkwsalŭ* /nkʷ-s-alu⁰/ (C-TR-spill.2SG) 'you spilled (it)'.

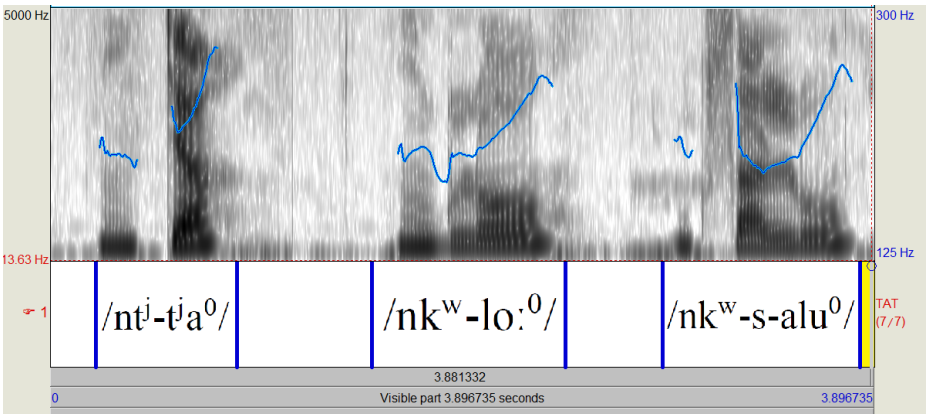


Figure 5.31: Pitch traces of /0/-toned *nttyă*, *nkwloŏ*, and *nkwsalŭ*

nkw-s-alŭ 'you spilled (it)' *nttyă* 'you bathe' *nkwloŏ* 'you removed (it)'

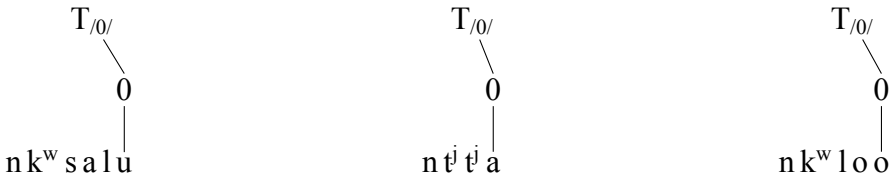


Figure 5.32: /0/ realized on three different word shapes

Figure 5.32 shows the autosegmental representations of the three words in Figure 5.31. In each case, the superhigh tone is linked to the final mora of the word, resulting in a sharp rise in pitch over the duration of the word's final vowel.

Figure 5.33 shows a spectrogram and pitch trace of the phrase *jwaʔăn nklyoŏ kwlyà* ^{0}*ntten* /hwaʔã^{0} nkl^{j}o:^{0} k^{w}l^{j}a^{L} nttẽ$^{0\text{-}X}$/ (thus G.INTR.release lark) 'the lark is escaping like this'. Over the course of the long vowel in *nklyoŏ*, F0 rises from a low level (∼195 Hz.) and rises to a very high pitch level (∼272 Hz.).

(39) shows the autosegmental representation of the phrase in Figure 5.33. Here *jwaʔăn* and *nklyoŏ* are each linked to their linked superhigh tones, and the linked L of *kwlyà* causes

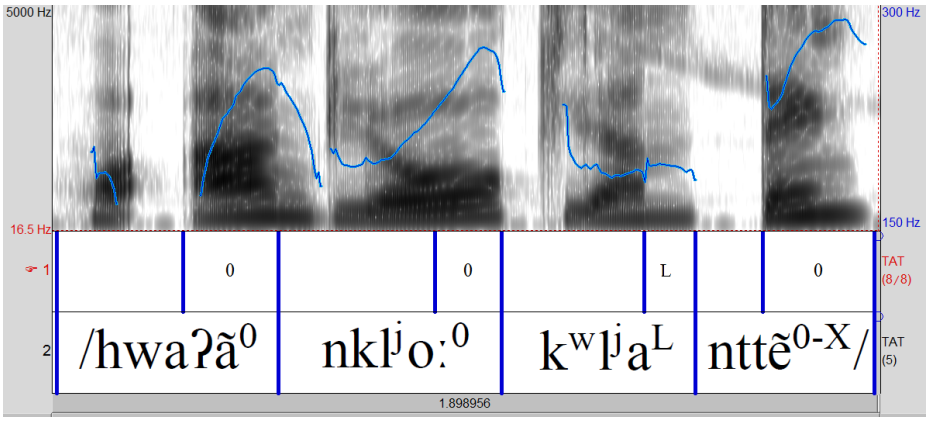
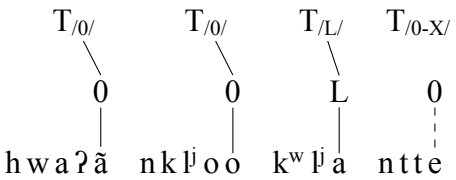


Figure 5.33: Pitch traces an /0-L/-tone word in two contexts

the linking of the unlinked superhigh tone associated with *⁰ntten*.

jwaʔăn nklyoŏ kwlyà ⁰ntten 'the lark bathes here'

(39)



5.3.8 Superhigh-Low /0L/

The final tone sequence is /0L/. This tone sequence contains two linked tones: a superhigh tone followed by an L tone. This L tone will cause the linking of a following unlinked superhigh tone and can spread into a following unassocaited mora. /CVCV^{0L}/ words in isolation are typically realized as [CV^{25}CV^{2}] (CV˥CV˩), /CV:^{0L}/ words as [CV:^{352}] (CV:˧˥), and /CV^{0L}/ words as [CV^{51}] (CV˥). Figure 5.34 provides some pitch traces of words of tone sequence /0L/ (*nxtyaâ* /nʃtʲa:^{0L}/ (G.place(.3)) 'is placing (it)' and *ntyalû* /ntʲ-alu^{0L}/ (G-grow(.3)) 'is growing'). Figure 5.35 provides the autosegmental representations

of these two words. In each, the final L tone is linked to the last mora of the word and the superhigh 0 is linked to the penultimate mora. In monomoraic words, both tones are linked to the word's only mora. In this way tone is persistent; linked tones always surface, even when this causes multiple tones to be linked to a single mora.

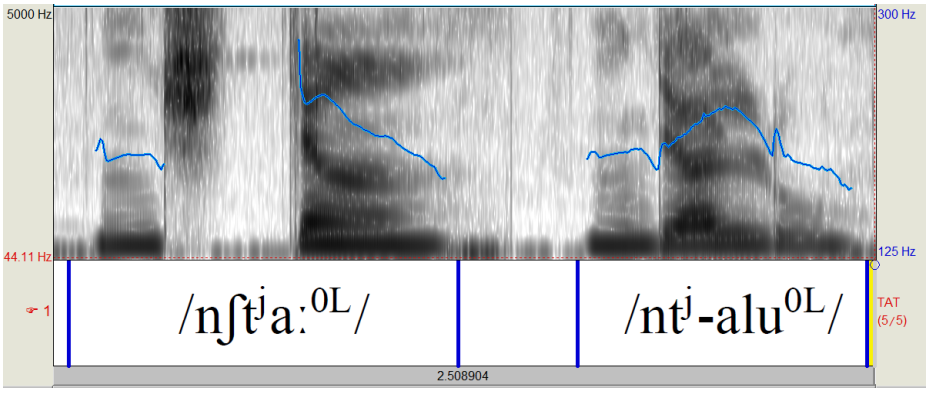
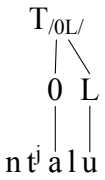


Figure 5.34: Pitch traces of /0L/-toned *nxtyaâ* and *ntyalû*

(40) lists some examples of /0L/-tone words in the lexicon.

nty-alû 'is growing'



nxtyaâ 'is placing (it)'

Figure 5.35: /0L/ realized on two different word shapes

(40) Lexemes of tone sequence /0L/

lakwâ	/lak^{w}a^{0L}/	'MIR'
tykuʔwâ	/t^{j}kuʔwa^{0L}/	'Santa Cruz Tututepec'
wixônʔ	/wiʃõʔ^{0L}/	'daughter!'
tikônʔ	/tikõʔ^{0L}/	'bird (sp.) *pájaro tico*'
chukwâ	/t͡ʃuk^{w}a^{0L}/	'woman!'

Figure 5.36 shows a spectrogram and pitch trace of the /0L/-toned word *nxalâ* in the phrase *nakwen nxalâ jakwā* ^{0}*tyaʔa* /nak^{w}ẽ^{X} nʃ-ala^{0L} hak^{w}a$^{H\widehat{L}}$ t^{j}aʔa$^{0\text{-}X}$/ (say(.3) G.TR-open four NCL) 'they say four are opening'. Note that the F0 rises sharply on the penultimate syllable of the /0L/-tone word to a very high part of this female speaker's range (∼282 Hz.) then falls quickly to the lower portion of the speaker's range (∼200 Hz.), tracing the same shape as the realizations of tone sequence /0-L/ when the superhigh tone has been linked.

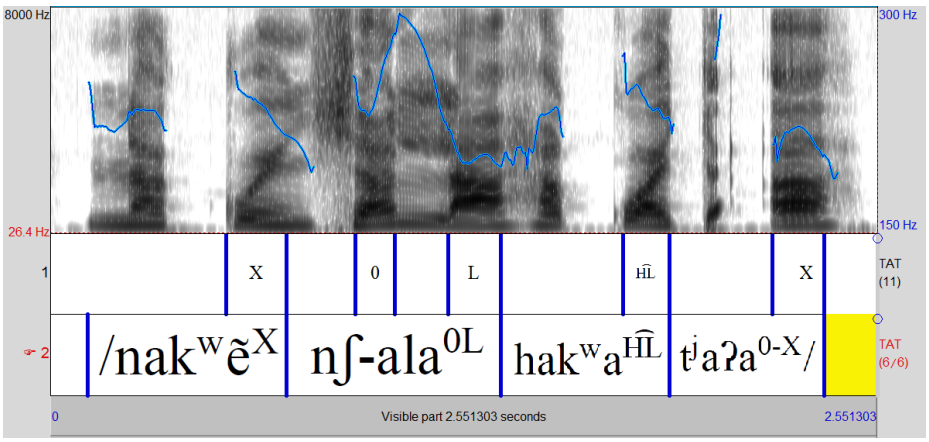


Figure 5.36: Pitch traces of disyllabic /0L/-tone word

(41) shows the autosegmental representation of the phrase in Figure 5.36. Here the L tone of *nxalâ* is linked to its final mora and the 0 tone is linked to is penultimate mora. The H͡L of *jakwā* is also linked to its final mora. Neither *nakwen* nor ^{0}*tyaʔa* are linked to

any tone since *nakwen*, being /X/-toned, is neither linked nor associated with any tone and the unlinked superhigh tone of /0-X/-toned *⁰tyaʔa* fails to surface since it is preceded by a tone which does not trigger superhigh tone linking.

nakwen nxalâ jakwā ⁰tyaʔa 'they say that four are opening'

(41)

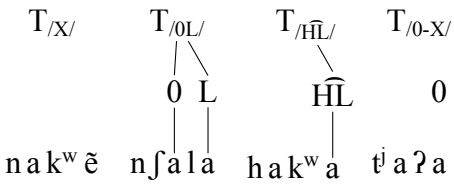


Figure 5.37 shows a spectrogram and pitch trace of the phrase *nakwen nxtyaâ tyunù* /nakʷẽˣ nʃtʲaː⁰ᴸ tʲunuᴸ/ (say(.3) G.place prawn) 'they say the *Macrobrachium* shrimp is placing (it)'. The superhigh tone associates to the first mora of the vowel of *nxtyaâ* and the low tone associates with the second mora of the vowel. The resulting F0 gesture is one of a fall from a high level (∼240 Hz. for this female speaker) to low level (∼203 Hz.) where the pitch remains constant for the second half of the vowel.

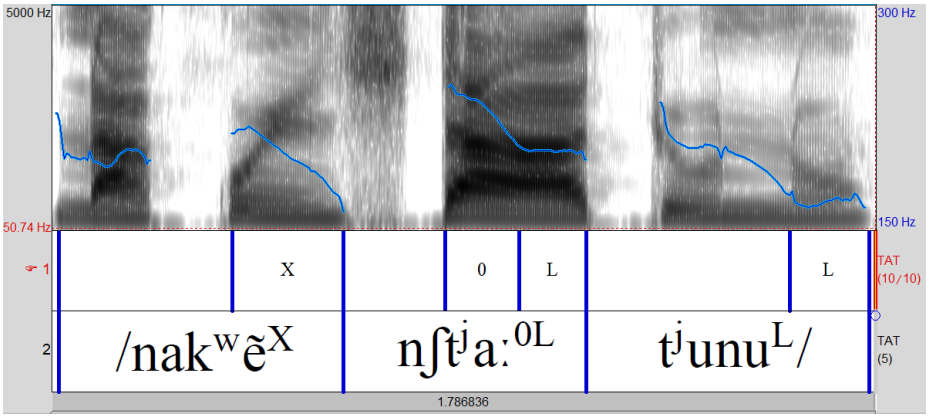


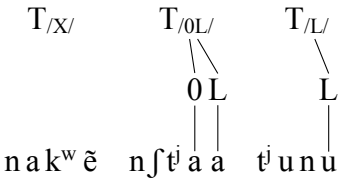
Figure 5.37: Pitch trace of a long monosyllabic /0L/-tone word

(42) shows the autosegmental representation of the phrase in Figure 5.37. Here the L

tones of both *nxtyaâ* and *tyunù* are linked to their final moras, and the 0 tone of *nxtyaâ* is linked to the penultimate mora. *Nakwen* is neither linked nor associated to any tone.

nakwen nxtyaâ tyunù 'they say the prawn is placing (it)'

(42)



5.4 Comparison to Zenzontepec and Eastern tone sequences

H. Cruz and Woodbury (2006) showed the existence of a number of etymological sets of words forming coherent tone sequences in Eastern Chatino based on tone correspondences between the Quiahije, Yaitepec, and Zacatepec topolects. Each of the sets they identified was coherent in each topolect, though the phonological realizations in each topolect were often quite distinct. Later research drawing on data from Zenzontepec Chatino, Tataltepec Chatino, and other Eastern Chatino topolects has expanded these etymological tone sets (identified by a letter with an additional number or subscript small letters to identify split classes) into an elaborate set of tone sets attempting to account for lexical tone correspondences across Chatino. Table 5.2 provides a summary of the correspondences of tone sets across Chatino. Some of these tone sets not only correspond to phonological sets across Chatino, but also to certain grammatical classes, such as progressive aspect verbs (Set I), numerals (Set J), and loanwords (Set K).

Comparing the phonological realizations of the tone sets in Table 5.2 shows a few interesting things. Tataltepec Chatino's /X/ tone sequence corresponds to Set A, which is

Tone Set	ZEN	TAT	pECH	ZAC	SJQ
A, X	∅∅	X	*X	X	X, L
B1	∅∅, ∅M, MH	0-X	*L-0	L-0, L-L	HL-0
B2	∅∅, ∅M, MH	0-L	*HL-0	L-0, L-L	HL-0
C	∅M	L	*M-H	M-H	M-H
D	∅M	0-X, 0-L	*M0L-L	M0L-L	H-0
E	HM	H	*MH	MH	H
F	MH	H	*LH	LH	LM
G	∅∅	L	*MM	MM	LH
H	HM	0-L	*L0	L0	M0
I (PROG)	∅∅	H͡L	*MML	MML	MH
J (numerals)	H∅, ∅∅, ∅M, MH	H	*HL, *LL	L-0, L-L	ML, ML-MH
K (loanwords)	∅M	0-L		LM-0	H-0

Table 5.2: Comparison of tone sets across Chatino

phonologically toneless across Chatino, except for those languages in which a low or mid tone is present rather than a phonologically null tone (as with some of Set A in Quiahije Eastern Chatino). Set B in Eastern Chatino corresponds to a number of the /0-X/ and /0-L/ tone sequences in Tataltepec Chatino. The /L/ tone sequence of Tataltepec Chatino corresponds to two Eastern Chatino tone sets, Set C and Set G, which have merged in Tataltepec Chatino but nowhere else. Similarly, Tataltepec Chatino's /H/ tone sequence also corresponds to two Eastern Chatino tone sets, Set E and Set F.

Chapter 6

Previous phonological analyses

Prior to the research of the current author there have been two published works on Tataltepec Chatino which have treated the phonology of the language, a bilingual Chatino-Spanish dictionary (K. Pride & Pride, 1970) and a more detailed work on lexical tone (L. Pride, 1984). The explicit and implicit analyses present in these works are largely in concert with each other and will be discussed together. This chapter is meant to serve as a comment on their previous analyses to correct a few inaccuracies in their analysis and to expand on those portions of the phonology which were overlooked in their work. This chapter is also meant to show the connection between the language described here and the language as it was reduced to writing in the documents produced with the orthography that was informed by their analysis.

6.1 Previous vowel analysis

In K. Pride and Pride (1970, vi), oral vowels are treated separately from nasal vowels, and five oral vowels are identified which are pronounced "más o menos iguales en chatino y castellano" (more or less than same in Chatino and Spanish), and three nasal vowels that "se pronuncian por la nariz" (are pronounced through the nose), as shown in Figure 6.1. In this orthography, nasalized vowels were represented by underlining a

vowel (<V>). This analysis differs from the present analysis in two respects: first, only one front nasal vowel is present (/ĩ/ <i̲>) rather than two vowels (/ĩ ẽ/), and second, the non-low back nasal vowel is taken to be a high vowel /ũ/ <u̲> rather than a mid vowel /õ/.

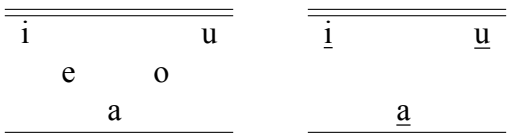


Figure 6.1: Vowel qualities of Tataltepec Chatino (K. Pride & Pride, 1970, vi)

Previous analyses merge /ẽ ĩ/ together as <i̲>, obscuring some near-minimal pairs such as <tyucuii̲> 'road' and <cuii̲> 'advice', which are represented as /tʲkʷĩːᴴ/ and /kʷẽːᴴ/ in the present analysis. This contrast is fairly marginal in Tataltepec Chatino, as it is in many other Chatino languages.[1] Nevertheless, speakers' productions of these sounds are distinct and--save for a *ĩʔ restriction--cannot be predicted by segmental or tonal context.

Though there is no argumentation for why the non-low back nasal vowel is represented with a high-vowel symbol as opposed to a mid vowel symbol (though this is a largely superficial distinction as /õ/ is realized over a wide space that occupies F1 and F2 values typical of both /o/ and /u/, as was shown in Fig. 3.31), the tradition of representing three-vowel systems with the three most peripheral values (/a i u/) and a desire to be symmetrical to the use of a high-front symbol for the nasal vowel likely also had some influence.

Though not addressed directly in K. Pride and Pride (1970); L. Pride (1984), the restrictions on penultimate vowels discussed in § 4.2.3 can be observed in the entries of

[1] I am aware of only one topolect which contains pure minimal pairs between /ẽ/ and /ĩ/. Quiahije Eastern Chatino has pairs such as *qen* /ʔẽ/ 'wind' and *qin* /ʔĩ/ 'his/hers' (E. Cruz, 2011, 52), which are apocopated cognates of Tataltepec Chatino's *kweʔen* and *jiʔìn*.

the bilingual vocabulary. Non-prominent vowels are not marked as nasal in any simplex stems in the vocabulary. Non-final mid vowels (that are not followed by a like vowel across a laryngeal consonant) are generally only present in loanwords (1), compounds (2), or occur with a high vowel in contemporary Tataltepec Chatino (3).

(1) Non-final /e o/ in loanwords in (K. Pride & Pride, 1970)

<bese>	*⁰jwesè*	/hwese$^{0\text{-}L}$/	'judge'	< Sp. *juez*
<cresiya>	*krasya*	/kɾasja^{X}/	'heart'	< Sp.*corazón*
<chere>			'scissors'	< Sp. *tijeras*
<ndyosi>	*ntyusì*	/nt^{j}usi^{L}/	'God'	< Sp. *dios*
<parelya>	*⁰pralyà*	/pɾal^{j}a$^{0\text{-}L}$/	'cane sugar'	< Sp. *panela*
<petye>			'rocket, fireworks'	< Sp. *cohete*
<setye>	*⁰setyè*	/set^{j}e$^{0\text{-}L}$/	'oil'	< Sp. *aceite*

(2) Non-final /e o/ in compounds in (K. Pride & Pride, 1970)

<Londaʹa>	*⁰lontaʔa*	/lo+ntaʔa$^{0\text{-}X}$/	'Oaxaca'
<loyuu>	*loyuū*	/lo:^{X}+ju:^{X}/ → /loju:$^{H\widehat{L}}$/	'territory'
<tojo'o>	*tyjoʔò*	/t^{j}a^{X}+hoʔo^{L}/ → /t^{j}hoʔo^{L}/	'ocean'

(3) Non-final mid vowels in (K. Pride & Pride, 1970) are high vowels in my corpus

<cocu̲>	*kukòn*	/kukõ^{L}/	'pygmy owl'	
<culexi>	*kwlixí*	/k^{w}liʃi^{H}/	'butterfly'	
<ndyosi>	*ntyusì*	/nt^{j}usi^{L}/	'God'	< Sp. *dios*

Though K. Pride and Pride (1970) identify several non-prominent vowels as long, I consider these to be erroneous. Long vowels are said to exist in <sa:^{21}ru^{4}> 'Saturday' (< Sp. *sábado*), <lo:^{21}ra^{4}> 'pound' (< Sp. *libra*), and several of the inflections of the root 'open', such as <ndyaala> 'opens (intr.)' and <xaala> 'will open (tr.)'. These long penultimate vowels are not attested in my corpus (e.g. *⁰sarù* /saɾu$^{0\text{-}L}$/ `Saturday' and *⁰salà* /sala$^{0\text{-}L}$/ `will open (it)'), and the longer durations the earlier researchers heard may be best understood as misinterpretations of pitch movements associated with particular tone se-

quences.[2] Similarly, the VʔVV sequence implied by <ngaʹaa> 'blue' is not present in my own data (/nkaʔa^{L}/).

Perhaps the most interesting differences between the data of (K. Pride & Pride, 1970; L. Pride, 1984) and my own data have to do with syllable structures. In general, the earlier analyses tend to present Tataltepec Chatino words as containing more vowels (and consequently more syllables) than can be found in the current corpus. Comparison of many of these forms to unsyncopated topolects of Zenzontepec Chatino and Zacatepec Eastern Chatino show that the vowels in these words are largely etymologically correct (so I consider it unlikely that they are invented), but in the absence of an explicit phonological explanation, it is not clear if a word like <ngulu′> 'ball, bullet' is pronounced with two full vowels, as in unsyncopated Zenzontepec Chatino (*nkuluʔ* [ŋgu.luʔ]) or as a monosyllable with a complex onset as it is pronounced in contemporary Tataltepec Chatino /nk^{w}luʔ^{L}/ and in more completely syncopated topolects like Yaitepec Eastern Chatino *nkwluʔ*^{3} [^{ŋ}g^{w}luʔ].

Many of the Tataltepec Chatino speakers I have recorded (and who produce syncopated versions of these words) were in Tataltepec during the Pride's residency in Tataltepec (ca. 1965 to 1980). Some of these actually served as informants in their twenties and thirties for the Prides and were interviewed in their fifties and sixties by myself or other CLDP researchers, which would suggest that the we should interpret the Pride's transcriptions like <ngulu′> as representing syncopated rather than unsyncopated forms.

[2] This theory is supported by some of the annotations in (K. Pride & Pride, 1981) where <nxaala> 'opens (tr.)' is corrected to <nxala>, but other inflections are left uncorrected. As loan words, both `Saturday' and `pound' would have have been of tone sequence /0-L/, much like several of the inflections of `open'.

However, since other morphological changes are apparent when comparing verb forms of K. Pride and Pride (1970) to contemporary Tataltepec Chatino,[3] it remains possible that these forms were still unsyncopated in at least careful speech by an older generation of speakers which I have not had access to.[4]

6.2 Previous consonant analysis

In contrast to the fairly clear picture of the Tataltepec Chatino vowel system that can be found in K. Pride and Pride (1970), a bit more interpretation is necessary to identify the consonant phoneme inventory implicit in this vocabulary since the authors only list the symbols in their alphabet (4), not the phonemes, and are heavily influenced by Spanish orthographic customs (representing /k/ as <qu> before front vowels and as <c> before consonants and non-front vowels). The letter <k> is reserved for those few words which are written with <k> in Spanish. Nevertheless, by inspecting the forms of their vocabulary, we can map their orthography onto the phonemic orthography of the present analysis to determine their analysis.

[3]For example, the Completive form of 'give' is provided as <ngutaa>, (representing either /nku-ta:/ or /nk^{w}-ta:/) indicating that it was a Class Au verb before 1970, but today has the Completive form /n-ta:^{H}/, which could not be confused with <ngutaa>, and indicates that *-taá* 'give' is currently a Class Bc verb.

[4]Non-prominent vowel syncopation could be a change that happens fairly quickly. All modern dialects of Zenzontepec Chatino have undergone a particular sounds change which can be greatly simplified as *CVCV > hCV, where an obstruent has become /h/ and the following (non-prominent) vowel has been elided. While this change has progressed differently in different dialects of ZEN (e.g. while the affected C can be a stop in all dialects, some also affect fricatives) there is no evidence of this historic sound change visible in Belmar (1902) suggesting that this vowel syncopation began and was nearly completed between ca. 1902 and ca. 1995 when the first modern academic researchers reported hCV cluster (Sullivant, under review).

(4) Tataltepec Chatino orthography (K. Pride & Pride, 1970, vi)

b	c	ch	d	f	g	h	j	′	k	l
m	n	ñ	p	q	r	s	t	x	y	

Another peculiar detail of K. Pride and Pride (1970) is the assertion that:

> También en muchas palabras chatinas la primera sílaba se forma de una o dos consonantes como en la palabra bcha, "pasado mañana", compuesto de dos sílabas, b y cha. Otros ejemplos son: cñii (c-ñii), "dinero". nscua′ (ns-cua′), "maíz". ltya (l-tya), "mazorca".
>
> Also in many Chatino words the first syllable is formed of one or two consonants as in the word *bcha*, 'the day after tomorrow', made up of two syllables, *b* and *cha*. Other examples are: *cñii* (c-ñii), 'money', *nscua′* (ns-cua′), 'maize', *ltya* (l-tya), 'ear of corn'.

This would suggest that either certain consonants are syllabic or perhaps are followed by voiceless vowels. While none of the initial sounds of these words (/w͡tʃa^{H}/ [ɸtʃa], /kn^{j}i:$^{0\text{-}L}$/ [kn^{j}i:], /nskʷaʔ^{L}/ [nskʷaʔ], and /lt^{j}a^{X}/ [ɬt^{j}a]) are syllabic, the more sonorous nature of most of these initial sounds relative to the following obstruent could suggest the presence of a syllable to a non-Chatinophone listener. One cannot say the same thing about <cñii> (/kn^{j}i$^{0\text{-}L}$/) and its stop-nasal onset. Given that many forms in K. Pride and Pride (1970) appear to be unsyncopated forms of words which are always syncopated in modern Tataltepec Chatino, it is possible that Pride and Pride are hearing a partial or reduced vowel in this form (perhaps something like [k^{i}n^{j}i]). This term is polysyllabic in some unsyncopated Chatino topolects (cf. ZAC *tùnyī* /tùn^{j}ī″/ 'money') .[5]

[5]These forms are borrowed from the Spanish *tomín* 'a type of silver coin', which is itself a loan < Arabic *thaamin* 'an eighth' since the coin was valued at one-eighth of a *castellano*. The absence of bilabials in all Chatino forms of this loan could suggest that the word passed through some other language before enter-

A later work on tonal phenomena (L. Pride, 1984) handles segmental phonology more explicitly. That analysis (reproduced in Table 6.1) clarifies some ambiguitites and under-specifications present in (4), and is largely similar to the present analysis save for Pride's inclusion of voiced stops (represented by <b d dy g gu gü> which in the present analysis are treated as allophones of singleton /t tʲ k kʷ/ between a nasal segment and a voiced segment, and the treatment of a voiceless labialized velar <hʷ> where this analysis identifies either a cluster /hw/ or a devoiced /w/ (i.e. word-initially before a voiceless segment) as the source of the sound [ʍ]. Pride's rationale for including /hʷ/ as a phoneme cannot be gleaned from this document, as /hʷ/ appears in none of the data presented therein.

Labials	Apico-dental	Palato-alveolar	Velar	Labialized velar	Laryngeal
p	t	tʸ [tʲ]	k	kʷ	ʔ
	d	dʸ [dʲ]	g	gʷ	
	c [t͡s]	č [t͡ʃ]			
	s	š [ʃ]			h
m	n	nʸ [nʲ]			
w hʷ [ʍ]		y [j] hʸ [ç]			
	l	lʸ [lʲ]			
	r [ɾ]				

Table 6.1: Phonemes according to (L. Pride, 1984)

These earlier sources also list many clusters not found in contemporary Tataltepec Chatino, such as <tly> and <ncly>. The first cluster is not found today due to the dissimilation of coronal-coronal sequences, though is historically conservative and is found today in cognate words in Quiahije Eastern Chatino, among others. (5) demonstrates this

ing Chatino, or else Sp. *tomín* was borrowed with an epenthetic vowel as *tumini* (itself not surprising if the plural *tomines* was commonly heard (cf. Zacatepec Eastern Chatino *milònī* /milònī˝/ 'melon' < Sp. *melón*)) which then suffered syncopation of medial segments (cf. TAT ^{0}*tminkkù* 'Sunday' < Sp. *domingo*).

by presenting Pride and Pride's transcription in the first column, the phonological form of these words in contemporary Tataltepec Chatino in the second column, and the cognate word in Quiahije Eastern Chatino in the third column.

(5) Coronal-coronal sequences in (K. Pride & Pride, 1970)

<tlya>	/klʲa$^{0\text{-}L}$/	*tlya^{HL+0}*	'early, morning'
<tlya′>	/klʲaʔ^{X}/	*tlyaʔ^{L}* ∼ *jlyaʔ^{L}*	'cold'
<tlyu>	/klʲuː^{L}/	*tlyu^{M}* ∼ *jlyu^{M}*	'big.SG'

These clusters may have legitimately been present in Tataltepec Chatino about forty years prior, though some later annotations to the 1970 vocabulary show some words like <tlya> corrected to read <clya>, suggesting that the authors may have been mistaken in their analysis of these clusters as coronal-coronal and not velar-coronal sequences (K. Pride & Pride, 1981). Another explanation is that [t] ∼ [k] in this context for the people they spoke with and/or during the time of their research, and I have simply not encountered Chatinophones who produce coronal stops here.

The <ncl> and <ncly> clusters are strange since (given that allophonic stop voicing is represented in the orthography) these would represent the only instances of voiceless stops in the voiced context (between a nasal segment and a voiced sonorant consonant). In contemporary Tataltepec Chatino these clusters are all produced with voiced stops, and it is unclear why Pride and Pride would favor a voiceless symbol for their transcriptions.

6.3 Previous tone analyses

Indication of tone is almost entirely absent from the orthography of K. Pride and Pride (1970), given that

> El acento indica voz más fuerte o tono alto y se emplea únicamente cuando es necesario para la distinción de dos palabras que de otra manera parecerían iguales, y en el contexto no indica cual palabra es.
>
> The accent indicate a stronger voice or a high tone and is used only when it is necessary to distinguish two words that would appear the same in other ways, and where context does not show which word it is.

By way of illustration, the authors give two sentences highlighting a case in which one member of a minimal pair is unmarked (6) and the other is marked (6-b), ostensibly because the latter has a higher tone or "stronger voice" than the former.

(6) a. *na ndacu ngu′*
REL H.eat 3PL
'what people eat'

b. *ná ndacu ngu′*
NEG H.eat 3PL
'they don't eat'

As can be seen in Table 6.2, the orthographic accent does not consistently correspond to any distinction (neither distinctions found in my own study of Tataltepec Chatino, nor Pride and Pride's own descriptions of the tone melodies listed in the table) in lexical tone: while <cuiñá′> (*kwinyáʔ* /kʷinʲaʔ^{H}/ 'deer') does differ from <cuiña′> (*kwinyaʔ* /kʷinʲaʔ^{X}/ 'honey') in the presence of a /H/ tone versus the absence of tone (/X/), in other pairs, it is the unmarked /X/ or /0-X/ tone sequence which receives the orthographic accent, e.g. <taná> (*tana* /tana^{X}/ 'pregnant') and <ja′bá> (*^{0}jaʔwa* /haʔwa$^{0\text{-}X}$/ 'banana') versus <tana> (*taná* /tana^{H}/ 'liquid') and <ja′ba> (*jaʔwá* /haʔwa^{H}/ 'corncrib'). Cases where tonal minimal pairs are not distinguished by an orthographic accent can even be found, as with *^{0}knyì*

Lexeme	Tone	Lexeme	Tone
<cuiña̲′>	HM	<cuiñá̲′>	LH
kwinyaʔ	X	*kwinyáʔ*	H
'honey'		'deer'	
<tana̲>	X	<taná̲>	HM
taná	H	*tana*	X
'liquid'		'pregnant'	
<quixu>	LH	<quixú>	HL
kxu	X	*kxù*	L
'net bag'		'avocado'	
<ple>		<plé>	
^{0}plè	0-L	*ple*	X
'blanket'		'foolish'	
<ja′ba>	HL	<ja′bá>	HM
jaʔwá	H	*^{0}jaʔwa*	0-X
'corncrib'		'banana'	
<chcu>	H	<chcú>	ML
tykú	H	*tyku*	X
'well, water source'		'penis'	
<tu′ba>	LH	<tu′bá>	ML
tuʔwá	H	*tuʔwa*	X
'forty'		'mouth'	
<catya̲>	ML	<catyá̲>	LH
katyàn	L	*katyán*	H
'bottle, glass'		'hammock'	
<cñii>	HL	<cñii>	HM
^{0}knyì	0-L	*knyi*	X
'money'		'piquant'	

Table 6.2: Minimal pairs (not) distinguished by orthographic accent in K. Pride and Pride (1970)

/kn^{j}i$^{0\text{-}L}$/ 'money' and *knyi* /kn^{j}i^{X}/ 'piquant' which are both written <cñii>. Thus, any philological treatments of K. Pride and Pride (1970) or works produced using this orthography, such as the New Testament translation (La Liga Bíblica, 1981) or the stable of pamphlets

and booklets printed by the Instituto Lingüístico de Verano and distributed in Tataltepec de Valdés,[6] should only interpret the orthographic accent to mean that a word has a homograph and not interpret any particular tonal value as a result.

Though absent from their orthography, K. Pride and Pride (1970) are aware that Tataltepec Chatino is a tonal language in which words are distinguished "no sólo por las letras sino también por el tono cuasi-musical de la vocal" (not only by the letters [i.e. segments -JRS] but also by the quasi-musical tone of the vowel). An abbreviation indicating the tone is sometimes offered after the headword in lexical entries. While the authors largely are correct in identifying the pitch trajectory of the lexeme's tonal melody, their analysis suffers in four regards:

1. Not every lexeme is identified with a tone, leaving much of the lexicon's phonology undescribed and open to interpretation
2. The tone bearing unit is not explicitly defined, though is implied to be the syllable
3. The tone descriptions identify phonetic tone levels, not phonemic tone
4. The impressionistic accounts serve to oversplit otherwise cohesive tone sequences

A sample of K. Pride and Pride (1970) shows that just roughly 2% of the lexicon has any tone indication.[7] Though some alphabetic orthographies do systematically fail to rep-

[6]Increasingly, SIL is digitizing these materials (in Tataltepec Chatino and many other languages of Mexico) and making them available online at `http://www-01.sil.org/mexico//pub/00e-Publicaciones.htm`

[7]Since I only have access to facsimile copies of K. Pride and Pride (1970), ten of the 43 pages of the Chatino-Spanish portion of the vocabulary were chosen at random, and the number of entries on each page and how many contained tonal information were noted. By this sample, only about 30 of the approximately 1488 entries would indicate tone. A similar twenty-page sample of K. Pride and Pride (2004), a dictionary of Panixtlahuaca Eastern Chatino suggests that approximately 57% of the estimated 4408 entries have tone indicated (though subsequent recent research into Panixtlahuaca Eastern Chatino have failed to corrobo-

resent some crucial part of its phonology,[8] in a reference work such as a bilingual dictionary, it would be prudent to include this information for non-speaker users, including heritage Tataltepec Chatino learners.

The few tone indications present in K. Pride and Pride (1970) suggest that the authors consider the tone-bearing unit to be the syllable, a notion that is developed explicitly in L. Pride (1984). While it is certainly the case that all modal vowels in a language will be produced with some fundamental frequency (F0) value which may change over its duration--only a voiceless vowel can be produced without pitch--treating monosyllabic words apart from disyllabic words serves only to split up coherent tone sequences.

The use of surface tone levels to label and define tone sequences also serves to split up tone sequences that are coherent on phonological and etymological grounds into many different categories. This is especially true of Pride and Pride's treatment of tone sequences /X/ and /0-X/, which are divided among several tone categories in their 1970 dictionary (7) and the later tone analysis (L. Pride, 1984). It is understandable that /X/ and /0-X/ would be so difficult to classify according to apparent phonetic tone level since words of this tone sequence are distinguished by being "toneless" and (unless /0-X/'s superhigh floating tone is linked) do not have any salient tonal landmarks of their own, and often have their phonetic pitch determined by preceeding lexemes (such as the spreading of [L]

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rate Pride and Pride's tonal analysis (Woodbury & Kingston, 2014)). K. Pride and Pride (1981) includes marginalia indicating the tones of lexemes in K. Pride and Pride (1970) according to the tone analysis of L. Pride (1984). Future work will compare the lexical tones assigned by Pride to those I have assigned to determine more fully whether the disagreements between our analyses represent any actual change or variation in Tataltepec Chatino.

[8]For example, contrastive stress in English or Russian, vowel quality in (unvocalised) Arabic and Hebrew, pitch-accent in Swedish and tone in Kinyarwanda are generally absent from these language's orthographies.

or [H], and the aforementioned linking of floating tones).

(7) Oversplitting of /X/ and /0-X/ in K. Pride and Pride (1970)

ML		HM		LH	
tyku	'penis'	*tana*	'pregnant'	*kxu*	'net bag'
tuʔwa	'mouth'	*⁰jaʔwa*	'banana'		
		knyi	'piquant'		
		kwinyaʔ	'honey'		

L. Pride (1984) identifies seven tones which contrast on the final syllable, four of which also appear on the penultimate syllable (Table 6.3). According to his analysis, the tone of all syllables other than final and penultimate syllables are either high or low, to contrast with the tone of the following syllable, and thus is entirely predictable.

Antepenult and earlier		Penult		Final	
High	2	High	2	High	2
Low	4	Low	4	Low	4
				Low Rise	43
				Mid rise	32
		High Rise	21	High Rise	21
				High Fall	23
		Low Fall	45	Low Fall	45

Table 6.3: Tones according to L. Pride (1984)

Of the possible thirty-five tone combinations,[9] twenty-three are observed, which is far higher than the number of tone sequences found in the present study. The combinations found by Pride are given in (8), the tone sequence in parenthesis is only observed as the product of a sandhi rule.

[9](7 final tones × 4 penult tones for disyllables) + (7 final tones for monosyllables)

(8) Tone combinations in L. Pride (1984)

	Monosyllable	High	Low	Rising	Falling
High	2	2.2	4.2	21.2	45.2
Low	4	2.4	4.4	21.4	
High Fall	23		4.23	21.23	45.23
Low Fall	45	2.45		21.45	
High Rise	21		4.21		(45.21)
Mid Rise	32		4.32		
Low Rise	43		4.43		

6.4 Previous tone sandhi analyses

Pride identifies four tone sandhi rules, two of which can be corroborated as describing the linking of the superhigh floating tone of words with /0-X/ or /0-L/ tones, and two others that appear to be attempts to instantiate ordinary sub-phonemic phonetic variation as phonological changes.

Pride Rule 1 (9), as exemplified by (10), in which the mid rise of a final syllable becomes a mid fall before words beginning with low tones, is not a phonological rule that I have observed. I presume that Pride heard phonetic effects of the interpolation of F0 between the high peak of one tone and the low phonetic target of the following word.

(9) Pride Rule 1: $4.32 \rightarrow 4.23 \; / \; \_\_ \begin{Bmatrix} 4.2 \\ 4.21 \\ 45.2 \end{Bmatrix}$

(10) * *nkatá tasá nkatá tasá*
nga^{4}*ta*^{32} + *ta*^{45}*sa*^{2} → *nga*^{4}*ta*$^{\mathbf{23}}$ *ta*^{45}*sa*^{2}
'white sheet'

Pride's rule 2 concerns the tone sequence /21.2/ which becomes the low-to-mid sequence

/45.2/ before some tone sequences (/2.4/, /(4.)21.23/, and /(4.)21.4/) but not others (11), or after tone sequence /21.2/ (12).

(11) Pride Rule 2a: $21.2 \rightarrow 45.2 / \_\_ \left\{ \begin{matrix} 2.4 \\ (4.)21.23 \\ (4.)21.4 \\ 4.2 \end{matrix} \right\}$

(12) Pride Rule 2b: $21.2 \rightarrow 45.2 / 21.23 \_\_$

These tone changes, exemplified in (13) and (14) are similarly not phonological rules in Tataltepec Chatino, and are likely interpretations of phonetic interpolation of F0 between tone landmarks, though confusion between verb aspects (e.g. between *nxasu* /nʃasu^{X}/ 'H.turn over' and *nxasū* /nʃasu$^{H\widehat{L}}$/ 'G.turn over') cannot be ruled out since the habitual and progressive aspects were not distinguished in K. Pride and Pride (1970).

(13) * *nxasu kwjí nxasu kwjí*
nša^{21}su^{2} + kwi^{4}hi^{2} → nša^{45}su^{2} kwi^{4}hi^{2}
'the skunk turns over'

(14) *wi^{21}lya^{23} + ka^{21}ta^{2} → wi^{21}lya^{23} ka^{45}ta^{2}*
wilyă kata wilyă kata
'will not bathe yet'

Pride's Rule 3, reproduced in (15) and exemplified in (16), which only applied to "some" words of the mid-low falling tone /2.45/ describes the linking of the superhigh floating tone of words of tone /0-L/. Both examples given in L. Pride (1984), *^{0}msù* /msu$^{0\text{-}L}$/ 'servant' (< Sp. *mozo*) and *^{0}mstàn* /mstã$^{0\text{-}L}$/ 'alms' (< Sp. *limosna*) are of tone sequence /0-L/.

(15) Pride Rule 3: $2.45 \rightarrow 4.23 / \left\{ \begin{matrix} 2.45 \\ 2.4 \end{matrix} \right\}$ —

(16) * *ntytzèn ^{0}msù ntytzèn [msû]*
ndyu^{2}ci^{45} + m^{2}su^{45} → ndyu^{2}ci^{45} m^{4}su^{23}
`the servant is frightened'

Pride's Rule 4 concerns the changes affecting the rising tone sequence /45.23/ both after (17) and before (18) certain tone sequences. This rule appears to try to describe the linking of the superhigh tone in words of tone /0-X/ as in (19) and (20). Both offered examples of this change involve words of tone sequence /0-X/ *k-^{0}alu* /k-alu$^{0\text{-}X}$/ 'P-grow' and *ty-^{0}aʔwe* /tʲ-aʔwe$^{0\text{-}X}$/ 'P.INTR-divide'. Given that /0-X/ words will be pronounced with a falling intonation when not preceded by a triggering tone, it is curious that Pride identifies these words as /45.23/ words--a rising tone in his system.

(17) Pride Rule 4a: $45.23 \rightarrow 21.45 / \_\_ \left\{ \begin{matrix} 4.21 \\ 45.23 \end{matrix} \right\}$

(18) Pride Rule 4b: $45.23 \rightarrow 45.21 / \left\{ \begin{matrix} 4.23 \\ 4.4 \end{matrix} \right\}$ —

(19) *ka^{45}lu^{23} + ču^{45}mi^{23} → ka^{21}lu^{45} ču^{45}mi^{23}*
k-^{0}alu chumí k-^{0}alu chumí
'the cat will grow'

(20) *kwi^{4}či^{23} + ka^{45}lu^{23} → kwi^{4}či^{23} ka^{45}lu^{21}*
kwchí k-^{0}alu kwchí [k-alŭ]
'it's the lion that will grow'

Thus it has been shown that the present analysis is largely in agreement with the analyses of earlier researchers with regards to segmental phonology (aside from differences

stemming from the geminate analysis of non-voicing stops and the presence of two front nasal vowels), but differs quite significantly regarding tonal phonology, which was largely ignored in K. Pride and Pride (1970).

Chapter 7

Lexical Categories

Having covered the segmental and tonal phonology of Tataltepec Chatino, the remainder of this dissertation will describe some of the lexical categories of the language and the inflectional morphology which is seen on nouns and verbs.

The lexemes of Tataltepec Chatino can be classified into a number of lexical categories according to their morphological, syntactic, and semantic behavior. This chapter will provide a brief description of some of these categories, state what behaviors are used to identify each, and list some of the inflectional or derivational processes associated with each. Though an overview of noun and verb inflection will be given in this chapter, the reader is directed to later chapters for fuller treatments of the inflection of nouns (Chapter 8) and verbs (Chapter 9).

Some of the most common and distinctive lexical categories in Tataltepec Chatino are verbs (§7.1), nouns (§7.2), prepositions (§ 7.3), adjectives (§7.4), adverbs (§7.5), quantifiers (§7.6), an unusual lexeme that has some traits of a numeral classifier (§7.7), and personal pronouns (§7.8). The remainder of this chapter will discuss each of these categories in turn.

7.1 Verbs

The Tataltepec Chatino verb is the only lexical category to be inflected for tense, aspect, and/or mood (TAM) through the presence of segmental prefixes (which may be null) and paradigmatic tone alternations. These TAM categories are referred to in much Zapotecanist literature as aspects, and each encodes a bundle of aspectual and modal features, and tense is generally unexpressed. Except as the second member of a compound verb, all verb stems in Tataltepec Chatino must appear inflected for aspect. Verbs may also be inflected through paradigmatic tone alternation and/or vowel mutation for subject. Verbs share some of these characteristics with other lexical categories, such as adjectives (which may have aspect prefixes) and inalienably-possessed nouns (which can also be inflected for person). These categories can be distinguished from verbs on other criteria; for example, adjectives and nouns have different syntactic distributions than verbs, and the person a noun is inflected for indicates its possessor rather than its subject.

Verbs are the locus of much of the inflectional morphology of Tataltepec Chatino, and the aspectual and subject inflection of verbs are discussed at length in §9.1 and §9.2 respectively. Though few productive derivational processes can be observed in Tataltepec Chatino, some measure of historical derivational morphology can be observed, especially regarding transitivity alternations where *s-* or *t-* derive a more transitive stem from a root and *x-* (which can be accompanied by a replacement of the root's tone class with /H/) derives more transitive verbs from either bare verb stems or potential aspect verbs. This later form of derivation is more causative in that external agents are typically added. Often pairs of more and less transitive verbs share a root but differ only in verb class, that is, in which set of allomorphs they use to mark aspect inflection. The distinction in tran-

sitivity can be gradient and a pair of more and less transitive verbs derived from the same roots can differ in transitivity in the gradient sense of Hopper and Thompson (1980), but have the same valence. Usually, the more transitive member of the pair will be seen as a more intentional verb than the less transitive member.

Given Tataltepec Chatino's Otomanguean affinity for compounding, many new verbs are created by creating a phrasal verb involving one of a small number of verb stems (typically *-oʔnì* 'do, make' or *-akà* 'be, become') and another stem. Inchoatives are typically created when the following stem is an adjective or a noun (as in (1)), and a great many verbs are created by following a Chatino verb stem with a nativized Spanish infinitive, as in (2) where *nkanà* is a nativized form of the Spanish infinitive *ganar* 'to win, earn'.

(1) ***nkkwà*** ***klyuù*** *cháʔ wiʔ*
C.be(.3) big.SG thing AFMN
'that thing **got big**.' (ASP01)

(2) *wiʔ* ***nkw-aʔnì nkanà***
AFMN C-do(.3) win
'They **succeeded**' (LQA04)

Chapter 9 discusses the inflection of verbs for aspect and subject in detail.

7.2 Nouns

7.2.1 Common nouns

Tataltepec Chatino's nouns can serve as the arguments of verbs and can be the possessors of other nouns. Nouns can mark a possessor either through juxtaposition (where the possessor follows the noun as in *sti* ^{0}*Patyù* (father Pedro) 'Pedro's father') or through a

tonal and/or vowel mutation, as in *stèn* (father.1SG) 'my father'. Nouns may be alienably or inalienably possessed. Only inalienably possessed nouns may be inflected for their possessor through tone and/or vowel mutation, and the possessors of alienably-possessed nouns (either another noun, a person clitic, or unexpressed) must be preceded by the preposition *jiʔìn*, as with *xnèʔ jiʔìn* ^{0}*Patyù* (dog NSUBJ Pedro) 'Pedro's dog'.

Occasionally inalienably-possessed nouns can be shown to be derived from an alienably-possessed noun through the addition of an *s-* or *x(k)(i)-* prefix.

Chapter 8 discusses the types of nouns and their possessor marking strategies in detail.

7.2.2 Relational nouns

Within the set of inalienably-possessed nouns are a group of body part terms which have had their meanings metaphorically extended and now can be used to indicate spatial relationships in a function similar to that of prepositions in many of the world's languages.

Relational nouns are inalienably-possessed nouns which can refer to body parts but are used to indicate spatial relationships in a manner similar to prepositions in other languages. (3) gives some examples of these relational nouns. The use of relational nouns is widespread throughout Mesoamerica and is a diagnostic feature of the Mesoamerican Language Area (L. Campbell et al., 1986). These relational nouns are thought to have developed their relational function from an extension of their nominal meaning to 'in the location of' the noun, to a conventionalized locational meaning. For example *kyaʔ* 'foot' began to be used to mean 'at the foot of', and ultimately was used to mean 'below' or 'at the

base of'.

(3) Relational nouns, and their meanings as common nouns

chòn?	'behind, above'	'back(.3)'
kee	'above'	'head(.3)'
sii?	'beside'	'rib(.3)'
tu?wa	'on the edge of'	'mouth(.3)'
loo	'on the surface of'	'face(.3)'
siyu?	'below, underneath'	'buttocks(.3)'
kya?	'below, at the base of'	'foot(.3)'
nè?	'inside'	'belly(.3)'

In some examples of these relational nouns in use, 'ribs' is used to mean 'alongside, at the side of' in (4), 'belly' is used to mean 'inside' in (5), and 'back' is used to mean 'behind, beyond' in (6).

(4) *tziyà?=^{0}ka nty-^{0}alà tyjo?ò* ***sii?*** *kee wi? li?*
suddenly C-open ocean ribs(.3) rock DEM:AFMN then
'Suddenly, the ocean opened up **alongside** the rocks.' (1R18)

(5) *nty-^{0}alu no kanse / nty-^{0}alu ji?ìn=nku? chá? lyeè ^{0}tzaa nt-aku=na*
H-fall NOM cancer / H-fall(.3) NSUBJ=3PL because fierce very H-eat=1IN
nà nty-kè? ***nè?*** *ktyon? no tykwàn*
REL H-cook(.3) belly(.3) pot REL metal
'People are getting cancer because we eat so many things that are cooked **in** metal pots.' (FMC01)

(6) *^{0}nya?a kwà? nt-u?ú ka* ***chòn?*** *kee wi?*
how C-go_out(.3) toward back(.3) rock DEF:AFMN
'How it [= a ladder] went out **behind** those rocks.' (1R18)

7.3 Prepositions

Whereas the relational nouns are homophonous with an inalienably-possessed noun referring to a body part, and are used to indicate spatial relationships, two words: *loʔó* 'with, and' and *jiʔìn* which marks a number of non-subject NPs, are not homophonous with nouns and encode a much wider set of meanings than just spatial relationships.[1] These words are the two prepositions of Tataltepec Chatino, which can occupy the same kind of syntactic slot as a relational noun, but have distinct properties.

7.3.1 The comitative *loʔó*

Loʔó has three functions, as a comitative (7), as an instrumental (8) and (often phonologically reduced to *lóʔ*) and to link together related clauses in discourse (9). Instrumental and comitative functions are often formally similar in the world's languages.

(7) ***loʔó*** *tyaʔà=na* */ jwaʔǎn l-^{0}aka nt-uʔu=na chilyuu* ***loʔó*** *tyaʔà=na*
with companion=1IN / thus S-be H-live=1IN world with companion=1IN
'**With** our companions. This is living in the world **with** our companions.' (BGH02)

(8) *k-^{0}oʔo=na jiʔìn tya wiʔ* ***loʔó*** *skàʔ*
P-drink=1IN NSUBJ water AFMN with drinking_gourd
'We drink water **with** a gourd cup.' (BGH01)

(9) ***lóʔ*** *tkwá tya tzaan n-^{0}taà loo liʔ*
and two AFF day H-give+face(.3) then
'**And** she withstood for two days.' (ASP03)

[1] Eric Campbell (p.c., 2015) notes the similarity of *jiʔìn* and its cognates throughout Chatino with a verbal expression meaning 'to strike'. Further investigation of this similarity may show that either one of these functions was derived from the other or both have a common origin.

The object of *-kwiʔ* 'speak' is typically flagged with *loʔó* (as in (10))rather than *jiʔìn* which flags most non-subject objects. No other verb has been observed to flag an argument with *loʔó*.

(10) *wiʔ no nty-kwiʔ **loʔó** nkuʔ l-^{0}aka knyá / nty-kwiʔ **loʔó***
DEM:AFMN REL H-speak(.3) with people S-be(.3) work / H-speak(.3) with
*^{0}lkalè / nty-kwiʔ **loʔó***
mayor / H-speak(.3) with(.3)
'Those are the people who speak **to** the authorities. They speak **to** the mayor. They speak.'[2] (SMJ01)

When *jiʔìn* flags the object of *-kwiʔ*, the predicate is interpreted as 'call (name)' like in (11) rather than 'speak'.

(11) *wiʔ nty-kwiʔ=kwa **jiʔìn** cháʔ l-^{0}aka yoò soʔon*
DEM:AFMN H-speak=1EX NSUBJ word S-be earth_oven hen
'We call that chicken *barbacoa*.' (FMC02)

In this example *cháʔ l-^{0}aka yoò soʔon* (word S-be earth_oven hen) 'the word is chicken *barbacoa*' is flagged by *jiʔìn*, to show that *-kwiʔ* means 'call' rather than 'speak here'.

7.3.2 The dative *jiʔìn*

The other preposition also has a number of functions. *JiʔìnJiʔìn* appears before the possessors of alienably-possessed nouns where it functions as a genitive or possession marker (12).

[2]This example is also an example of the frame tag construction that forms part of the rhetoric of Chatinophone discourse. See H. Cruz (2014) for an in-depth treatment of this phenomenon in Quiahije Eastern Chatino.

(12) *no tykwiín* ***jiʔìn no ⁰nyatèn ⁰tzoʔo*** *tza+ntì ti*
NOM road NSUBJ NOM people good yay_big LIM
'The righteous path (*lit.* path **of the good people**) is [small] like this.' (1R05)

It also appear before many different kinds of non-subject arguments. These arguments can have a patient role ((13) and (14)) or could be a recipient (15), or could be the beneficiary of the action of the verb (16).

(13) *ni naa ty-kwan=ma* ***jiʔìn*** *nii liʔ*
uh P-lift=2PL NSUBJ(.3) say(.3) then
'"Uh, save **it**" they say then.' (FMC04)

(14) *kù x-anó* ***jiʔìn ⁰nyatèn***
already CAUS-leave(.3) NSUBJ people
'(he) will abandon **people**' (FMC04)

(15) *∅-⁰taà tana / ∅-⁰taà* ***jiʔìn=ya*** *nǐ*
P-give(.3) liquid / P-give(.3) NSUBJ=1EX AFF
'They'll give medicine; they'll give it **to us**.' (SMJ01)

(16) *no naʔnì nkw-⁰teen xì yaka nkw-⁰teen* ***jiʔìn jyoʔó stèn***
REL animal C-haul(.3) little_bit wood C-haul(.3) NSUBJ CL:DECEASED father.1SG
'The animal that hauled a bit of wood, it hauled **for my late father**.' (BGH02)

The many different uses of *jiʔìn*: to mark possessors, obliques, and some objects can all be grouped under the label "dative". While it has been shown that cognates of *jiʔìn* in other Chatino languages are better understood as different parts of speech when serv-

ing different functions,[3] this kind of careful syntactic analysis has not been undertaken for Tataltepec Chatino, and I provisionally presume that *jiʔìn* is one word (a preposition) which has multiple functons. To succinctly identify all of these functions without privileging any one of them, I gloss it as 'non-subject' (NSUBJ) throughout this work.

Jiʔìn always appears before receipients, beneficiaries, and possessors, but may or may not appear before objects. Many different proposals have been put forth to explain this differential object marking in Chatino. Most of the analyses of ZEN's differential object marking have appealed to information structure, with *jiʔi̱* being argued to flag focused objects (Carleton & Waksler, 2002), objects which are secondary topics (Dalrymple & Nikolaeva, 2011), or topical beneficiaries, maleficiaries, and locations in addition to secondary topics (E. Campbell, 2014). Recent work on SJQ has also found that differential object marking with *qin*^{4} /ʔĩ/ (in monotransitives at least) is sensitive to the animacy, definiteness, specificity, and discourse status of the object (H. Cruz & Broadwell, 2014). While the factors influencing the appearance or non-appearance of TAT *jiʔìn* with objects have not been fully explored, some of the features found to explain the differential object marking in other Chatino topolects (especially topicality, animacy, definiteness, and specificity) would appear to also influence object marking with *jiʔìn* in TAT as well.

7.4 Adjectives

Tataltepec Chatino's adjectives follow nouns and describe a property of that noun, as seen in (17) and (18). Like verbs, they can be further modified by one or more of a set of

[3]H. Cruz and Broadwell (2014) find that SJQ *qin*^{4} is a preposition when marking recipients and the objects of monotransitive verbs, but is a case marker when marking the objects of ditransitive verbs.

adverbs.

(17) ***kchen ^{0}ksù?*** *tzaă l-^{0}aka jwá n-akwen=nku?*
town old very S-be(.3) DEM:DIST H-say=3PL
'They say that that [=Tututepec] is a very **old town**.' (FMM01)

(18) *n-^{0}tkwa ska* ***^{0}smalyù ^{0}kwsòn*** *ke=ni*
H-sit(.3) one hat worn_out head=3.RESP
'A **worn-out hat** was on his [=Jesus's] head.' (EML01)

In addition to being used descriptively, adjectives can be used in copular predicates as in (19) and (20). In contrast to copular expressions involving nouns, the verb *-akà* 'be' (especially the stative aspect *l-^{0}aka*) is often omitted in copular expressions involving adjectives. This distinction is a key syntactic test for distinguishing between adjectival and nominal lexemes.

(19) ***piti ^{0}lonta?a*** *li?*
small.SG Oaxaca then
'**Oaxaca was small** then.' (LM01)

(20) *nkkwà ^{0}tyampù nu* ***^{0}ti?i*** *tzaă* ***kchen*** *li?*
C.be(.3) time REL poor very town then
'There was a time when the **town was very poor**.' (1R17)

A number of adjectives are morphologically simple, but others appear to carry historical prefixes. The forms in Figure 7.1 suggest that these prefixes include *l-* (a-e), *t-* (f-i), *ty-* (j-l), and the erstwhile completive prefix *nk(w)-* (m-s), as well as *n-* which appears on many color terms throughout Chatino.

	TAT	Gloss	Source	
a.	*lkaa*	'whole'		
b.	*lkala*	'opaque'		
c.	*lkatí*	'delicate, holy'		
d.	*lkichiʔ*	'filled, stuffed'		
e.	*lkutí*	'soft'		
f.	*⁰tkalyaʔ*	'cool'		
g.	*tkalyā*	'hard'		
h.	*tkilyi*	'slippery'		
i.	*tkwì*	'difficult'		
j.	*tykànʔ*	'thick, dense'		
k.	*⁰tykeʔ*	'hot'		
l.	*⁰tykatzòn*	'warm'		
m.	*nkwla*	'mature, big'	nkw-(a)lá	C-be_born
n.	*⁰nkwlaa*	'loose'	nkw-laà	C-free
o.	*nkwlakwán*	'blessed'	nkw-lakwán	C-bless
p.	*nkkéʔ*	'boiled'	nk-(a)kéʔ	C-cook
q.	*nkkwà*	'wise'	nkw-(a)kà	C-become
r.	*⁰nkwson*	'worn out'	nkw-(a)sòn	C-wear_out
s.	*nkwtaàʔ*	'broken'	nkw-taàʔ	C-break

Figure 7.1: Adjective morphology

Most basic color terms, of which there are five,[4] (as seen in Figure 7.2) appear with an *n-* prefix when used as adjectives (a-e), but appear without this prefix in many complex lexemes, including toponyms (f-n). This *n-* prefix is considered cognate to a *na-* prefix reconstructed for many of these color terms' Proto-Zapotec cognates (Kaufman, 1993-2007), and may suggest that these color terms were originally predicates or deverbal adjectives.

[4]The presence of only five basic color terms, and a lack of a basic lexical distinction between 'green' and 'blue', is widespread throughout Mesoamerican languages.

	TAT	Gloss	
a.	*n-katén*	'white'	
b.	*n-katá*	'black'	
c.	*n-kaʔá*	'red'	
d.	*n-kaʔà*	'green, blue'	
e.	*n-^{0}katzi*	'yellow'	
f.	*kchànʔ katen*	'gray hairs'	(hair + white)
g.	*nkinyaʔ katà*	'type of beeswax'	(wax + black)
h.	*nskwàʔ kwnyí ^{0}kaʔà*	'purple corn'	(maize + cultivated + red)
i.	*kee katzi*	'Piedra Amarilla'	(rock + yellow)
j.	*kiì ^{0}katzi*	'type of grass'	(grass + yellow)
k.	*kwchí ^{0}katzi*	'jaguarundi'	(wild_animal + yellow)
l.	*kwtyèʔ ^{0}katzi*	'sugar ant'	(ant + yellow)
m.	*latàʔ ^{0}katzi*	'type of tree fiber'	(tree_fiber + yellow)
n.	*ntaa ^{0}katzi*	'type of bean'	(bean + yellow)

Figure 7.2: Color terms with and without prefixes

There appears to be a somewhat productive process of partial reduplication to form intensive versions of adjectives and adverbs, as exemplified in (21).

(21) *nkaʔà / siʔí nà **tzu-^{0}tzoʔo ^{0}ka** / kù ^{0}tiʔi / kù kcha tìʔ=ya*
no_more NEG REL RED-good AFF already poor already ill essence=1EX
'No more. It's not that things are **very good**: we're in pain and we're sick.'(SMJ02)

A partial list of these reduplicated verbs can be found in (22).

(22) Partial reduplication in intensive adjectives and adverbs

ki-knyiʔ ^{0}ka	RED-piquant AFF	'very piquant'
ki-klyoō ^{0}ka	RED-first AFF	'very, absolutely first'
tzi-tziyàʔ ^{0}ka	RED-suddenly AFF	'very suddenly'
xi-xì ^{0}ka	RED-little_bit AFF	'very little'
xi-xtyiʔì ^{0}ka	RED-while AFF	'very soon'
xu-xkwiīʔ ^{0}ka	RED-only AFF	'nothing but'
tzu-^{0}tzoʔo ^{0}ka	RED-good AFF	'very good'

All of these expressions are followed by the particle *^{0}ka* whose meaning and function is poorly understood. There is no mention of this type of reduplicative process in other Chatino languages. Partial reduplication is found in the intensive adjective *vāvāha* /vā-vāʔà/ (RED-good) 'very, much' in nearby Jamiltepec Coastal Mixtec (Johnson, 1988, 119).

A number of lexemes commonly thought of as nouns, such as *tyjyàn* 'bone', also can be used to modify another noun in expressions that bilingual speakers will translate with adjectives ('scrawny' in the case of 'bone' used adjectivally). E. Campbell (2014, 339) mentions a similar situation in ZEN where a lexeme will at times clearly function as a noun or as an adjective.

7.5 Adverbs

There appear to be many distinct kinds of lexemes in Tataltepec Chatino that could all conceivably be considered adverbs. There is a set of adverbs which appear immediately after verbs and adjectives, a set of adverbs which immediately precede verbs, and a class of spatio-temporal adverbs which can either occur at the beginning or the end of a clause. Adverbs are invariant and are not inflected for any grammatical feature. Several adverbs can appear before and after a verb. While the investigation of adverbs associated with the

verb is preliminary at this point, some of the possible adverb sequences are presented in the schematic in Figure 7.3.

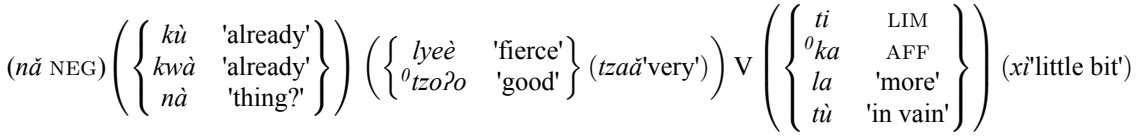

Figure 7.3: Verbal adverb schema

A negative adverb appears to be the first possible adverb, followed by either *kù* or *kwà*, which appear to be variants of the same word which is glossed by speakers as 'already' (though they can be used with potential aspect verbs referring to future events), or *nà* which is a poorly-understood particle which is often glossed as 'thing' and whose function is unclear. Verbs are very often immediately preceded by the adverbs *lyeè* 'strong, great, much'[5] or *⁰tzoʔo* 'good, well', both of which can be themselves intensified by the adverb *tzaă* 'very'. After the verb, one of a number of post-verbal adverbs with various meanings, some of which are poorly understood, can appear. Some of these appear formally similar to particles in other nearby Zapotecan languages, such as *⁰ka* which may be related to Coatec Zapotec *ka*[7], which functions (among other things) as a focus particle in that language and is often glossed as 'yes' (Beam de Azcona, 2004, 241). The examples in (23) through (30) show some examples of these adverbial particles use in combination with each other.

[5]The use of 'strong' or 'fierce' as an intensifying adverb may be a areal feature of the greater Chatinophone region as Coastal Mixtec languages use a lexeme like JAM *xaan* /ʃa̰a̰/ 'strong, fierce' with a similar function (Johnson, 1988).

(23) ***nă kù*** *naʔā nt-oòn ska kee tzantè*
NEG already C.see.2SG G-stand one rock yay_big
'Didn't you see an upright stone yay big?' (ASPFMC01)

(24) ***kù lyeè*** *nty-akâ+tzaʔán=nkuʔ liʔ*
already fierce G-be+fill=3PL then
'They're already learning a lot.' (LQA02)

(25) ***kù ^{0}tzoʔo*** *ntz-uʔu tykeé=ya cháʔ n-kaʔán=nkuʔ loʔó tyaʔà*
already good G-exist chest=1EX COMP H-sit_in_place=3P with companion
'We feel good because they are with their siblings' (ASPFMC02)

(26) ***^{0}tzoʔo tzaă*** *nyaʔa+seèn=nkuʔ jiʔìn snyiʔ=nkuʔ*
good very H.see+care=3PL NSUBJ offspring=3PL
'They take very good care of their children.' (LQA01)

(27) *knyá no nty-^{0}ka* ***ti xì***=ʔná
work NOM H-be_able(.3) LIM little_bit=DAT.1SG)
'The work that I can do just a little' (ASFM01)

(28) *tyà nt-aá* ***^{0}ka xì*** *ska kwjèn nskwàʔ cháʔ k-^{0}ja*
still C-give(.3) AFF little_bit one bag maize COMP P-be_found(.3)
k-ôn / tyà nt-aá ***^{0}ka xì***
P-eat.1SG / still C-give(.3) AFF little_bit
'He still gave [me] a bag of maize so that I could have something to eat.' (ASFM1)

(29) *lóʔ no ktyonʔ nĭ tiyaʔ* ***la xì*** *ty-^{0}akeʔ nà nèʔ*
and NOM pot AFF slow more little_bit P.INTR-cook thing belly(.3)
'And the [clay] pots, things take longer to cook in them.' (FMC01)

(30) *nkw-^{0}toʔòn* ***tù*** ***xì*** *^{0}skwalyà nkchàʔ pero nkaʔà cháʔ*
C-go_out.1SG in_vain little_bit school in_vain but no_more because
^{0}naʔà kuʔwí wiʔ
C.see.1SG drunk DEM:AFMN
'I went to school, but I didn't go anymore when I saw that he [=a teacher] was a drunk.' (1R16)

Apart from adverbs associated with the verb complex are clausal adverbs which generally occur at the beginning or the end of a clause, and typically have spatiotemporal meanings. A subset of these includes a set of deictic day names which are used to identify a day following or preceding the current day by up to three days.

7.6 Quantifiers

Tataltepec Chatino has a set of lexemes that modify nouns that do not follow the nouns they modify (like adjectives) but instead precede them. These words generally modify the nouns in terms of their quantity, and are therefore identified as quantifiers. One large subset of quantifiers are the numerals, which themselves can be subdivided into cardinal, ordinal, and additive numerals.

7.6.1 Numerals

Like many Mesoamerican languages, Tataltepec Chatino features a vigesimal numeral system in which '20' forms a numeral base rather than the '10' common in many of the world's languages. Like all vigesimal systems I am aware of, Tataltepec Chatino does not simply have nineteen unique and unanalyzable numeral terms within each decade (of twenty) but rather shows vestiges of a smaller sub-base system (here a quinary base-5)

used in forming numerals within each decade.

Numerals occur in three guises in Tataltepec Chatino, as cardinal numerals, as ordinal numerals, and as additive numerals. Of these, the cardinal and additive numerals are most tightly related as additive numerals are generally clearly derived from cardinal numerals, and ordinal numerals form a smaller defective set which appear to be only distantly related to their corresponding cardinal or additive numerals.

Numerals precede the enumerated nouns, as in (31) and (32), though erstwhile cardinal numerals occurring after a noun take on the function of an ordinal numeral.

(31) *n-^{0}tkanì=nkuʔ jnaàʔ cháʔ tzaʔán k-^{0}ukènʔ nskwàʔ ^{0}kwantyà*
H-ask=3PL NSUBJ.1SG COMP P.NB.go.1SG P-cook.1SG maize account
jakwā ^{0}kasò
four bowl
'They ask me to go and boil **four pots** of corn.' (BGH02)

(32) *ntzuʔu su n-^{0}taà=nkuʔ **snóʔ ^{0}tyaʔa tyja***
G.exist(.3) where H-give=3PL eight NCL tortilla
'There are places where people give **eight tortillas**. (ASFM03)

7.6.1.1 Cardinal numerals

There are unique numeral terms for 1-10, after which '10' is used as a sub-base for 11-14 (during which series an additive form of 1-4 is added to the '10' sub-base), then a special form for 15, after which '15' acts as a sub-base for numerals 16-19. Table 7.1 shows the construction of numerals from '1' to '40', and Table 7.2 shows the numeral bases from '45' to '100'. In these tables MOD is meant to indicate that a numeral root or stem has been altered in some way, though precisely how is unclear. For example, it is unclear why the

numeral for '5', which is normally *kaʔyú* would appear with a word-initial nasal in '25' *kalá nkaʔyú* (20 MOD.5), and there is no inflectional or derivational process I am aware of which is could explain the relationship of the forms meaning '20' in '20' *kalá* and '60' *sná ^{0}yalà* (3 MOD.20).

The numeral system of Tataltepec Chatino is largely similar to that of other Chatino languages and the Proto-Chatino numeral system reconstructed by E. Campbell and Cruz (2009). Beyond the first decade, numeral primes are added to higher bases, which could themselves be formally complex. For example, '75' is *sná yalà tyií nkaʔyú* (3 MOD.20 ADD.10 MOD.5). Tataltepec Chatino along with the rest of the Core Chatino languages uses analytical forms of decades beyond '40' (i.e. '60' = 'three score' and '80' = 'four score') whereas the extinct and divergent Teojomulco Chatino had unique forms for '60' <cañog> and '80' <adyall>, which are either Proto-Zapotecan retentions or loans from some Zapotec language (Belmar, 1902; Sullivant, under review).

7.6.1.2 Additive numerals

Many of the cardinal numerals (those which begin with a coronal) correspond to a form which appears to have undergone inflection similar to that associated with the Potential prefix, forming what I analyze as 'additive' numerals. (33) lists the additive numerals which have been observed in Tataltepec Chatino on the left and compares them to their corresponding cardinal numerals.[6] Whereas cardinal numerals are vague (in the sense that the truth conditions for a statement like 'I own two pairs of shoes' is satisfied

[6]The palatalization of these initial coronals, and the lateral found in *jlyakwā* led E. Campbell and Cruz (2009) to reconstruct *li before these numerals, which may have been an earlier additive prefix, that has been lost entirely before numerals beginning with non-coronals, and underwent a metathesis in *jlyakwā*.

tzaká	'1'	1	*kalá ^{0}ntkwa tsaká*	'21'	20 H-sit 1
tkwá	'2'	2	*kalá ^{0}ntkwa tkwá*	'22'	20 H-sit 2
sná	'3'	3	*kalá ^{0}ntkwa sná*	'23'	20 H-sit 3
jakwā	'4'	4	*kalá ^{0}ntkwa jakwā*	'24'	20 H-sit 4
kaʔyú	'5'	5	*kalá nkaʔyú*	'25'	20 MOD.5
skwa	'6'	6	*kalá ^{0}ntkwa skwa*	'26'	20 H-sit 6
katí	'7'	7	*kalá n-^{0}tkwa katí*	'27'	20 H-sit 7
snonʔ	'8'	8	*kalá n-^{0}tkwa snonʔ*	'28'	20 H-sit 8
kaá	'9'	9	*kalá n-^{0}tkwa kaá*	'29'	20 H-sit 9
tií	'10'	10	*kalá tyií*	'30'	20 ADD.10
tíchaka	'11'	10 + ADD.1	*kalá tyií n-^{0}tkwa tsaká*	'31'	20 ADD.10 H-sit 1
títykwa	'12'	10 + ADD.2	*kalá tyií n-^{0}tkwa tkwá*	'32'	20 ADD.10 H-sit 2
tíxna	'13'	10 + ADD.3	*kalá tyií n-^{0}tkwa sná*	'33'	20 ADD.10 H-sit 3
tíjlyakwā	'14'	10 + ADD.4	*kalá tyií n-^{0}tkwa jakwā*	'34'	20 ADD.10 H-sit 4
tiʔyón	'15'	15	*kalá tyií nkaʔyú*	'35'	20 ADD.10 MOD.5
tiʔyón chaká	'16'	15 + ADD.1	*kalá tyií n-^{0}tkwa skwa*	'36'	20 ADD.10 H-sit 6
tiʔyón tykwá	'17'	15 + ADD.2	*kalá tyií n-^{0}tkwa katí*	'37'	20 ADD.10 H-sit 7
tiʔyón xná	'18'	15 + ADD.3	*kalá tyií n-^{0}tkwa snonʔ*	'38'	20 ADD.10 H-sit 8
tiʔyón jlyakwā	'19'	15 + ADD.4	*kalá tyií n-^{0}tkwa kaá*	'39'	20 ADD.10 H-sit 9
kalá	'20'	20	*tuʔwá*	'40'	40

Table 7.1: Numerals 1-40

tuʔwá nkaʔyú	'45'	40 MOD.5
tuʔwá tyií	'50'	40 ADD.10
tuʔwá tyií nkaʔyú	'55'	40 ADD.10 MOD.5
sná yalà	'60'	3 MOD.20
sná yalà nkaʔyú	'65'	3 MOD.20 MOD.5
sná yalà tyií	'70'	3 MOD.20 ADD.10
sná yalà tyií nkaʔyú	'75'	3 MOD.20 ADD.10 MOD.5
tuʔwá yalà	'80'	4 MOD.20
tuʔwá yalà nkaʔyú	'85'	4 MOD.20 MOD.5
tuʔwá yalà tyií	'90'	4 MOD.20 ADD.10
tuʔwá yalà tyií nkaʔyú	'95'	4 MOD.20 ADD.10 MOD.5
ska ^{0}syenttò	'100'	1 + Sp. *ciento* '100'

Table 7.2: Numeral bases 45-100

if I own exactly two pairs of shoes or if I own three pairs or more), ordinal numbers indicate a precise quantity of referents that is or will be added to an identified set of those referents.

(33) Additive numerals

chaka	'one more, other'	*tzaka*	'one'
tykwá	'two more'	*tkwá*	'two'
xná	'three more'	*sná*	'three'
jlyakwā	'five more'	*jakwā*	'four'
tyií	'ten more'	*tií*	'ten'

(34) and (35) give examples of the use of additive numerals.

(34) ***tykwá*** *tya tzaan n-^{0}taà loo*
ADD.two ? day H-give face
'He withstands for **two more** days.' (ASP03)

(35) *nkw-^{0}to?òn knyà? xì sná jakwā ijan / n-taá=nku? **chaka***
C-go_out.1SG rest little_bit three four year / C-give=3PL ADD.one
^{0}martomà
stewardship
'I sat out for three or four years; then they gave (me) **another** stewardship.'(EPJ01)

The function of an additive numeral can also be fulfilled by preceding a numeral without an additive form with *chaka* 'one more, another', as in (36).

(36) *pero nă nty-^{0}u?ù+skwá no skwá ^{0}tya?a wi? / tyà nttì? la **chaka***
but NEG H-go_out+sit(.3) NOM six NCL AFMN / still want(.3) more other
*tyà **skwá** ^{0}tya?a nku?*
still six NCL person
'But those six [schoolteachers] didn't suffice; they still wanted **another six**.'(LQA02)

7.6.1.3 Ordinal numerals

Tataltepec Chatino has a small number of ordinal numerals which are formally distinct from cardinal numerals: *klyoō* 'first', *tykwā* 'second', and *tyunā* 'third'. These distinct forms precede the nouns they modify, as seen in (37) and (38).

(37) *ti ji?ìn **klyoō ^{0}karò** nty-alà li?*
who NSUB(.3) first car C-arrive(.3) then
'Who'd the **first car** to arrive [on the new highway] belong to?' (1R04)

(38) *nty-^{0}ka **tyunā tzaan** li? nǐ / li? ty-^{0}ala ^{0}yumà li? ntè klyá*
H-be(.3) third day then AFF / then P-arrive(.3) spirit then LOC early
'Then it's the **third day**; the spirits arrive in the morning then.' (ASP03)

Beyond 'third', ordinal numerals are formally similar to cardinal numerals, but have a different syntactic distribution. These higher ordinal numerals behave syntactically more

like adjectives, and follow the noun phrases they modify, as with *niʔi kalá* (house twenty) 'the twentieth house'.

7.6.2 Other quantifiers

In addition to the numerals, there are a number of non-numeral quantifiers expressing ideas such as *lkaa* 'all' (39), 'each' (40), 'every' (41), and 'few' (42). Figure 7.4 gives some of these non-numeral quantifiers.

(39) ***lkaa*** *no* *^{0}knyiì* *^{0}mstàn* *nty-^{0}ji* *jiʔìn* *joʔò* *nty-aʔan*
all NOM money alms H-be_found NSUBJ holy H-walk
'The Saint who Walks[7] gets **all** the alms.' (FMC01)

(40) *yàʔ* *k-^{0}achaʔ=na* *jiʔìn=nkuʔ* *^{0}nyaʔa* *^{0}naa* ***saskà*** *loo*
when P-advise=1IN NSUBJ=3PL how H.be_named each class
'When we will tell these people the names of **all** kinds of things.' (LQA03)

(41) *loʔó* ***kataʔă*** *nkúʔ* *kwnaʔá*
and every person female
'and **all** the women' (ASFM01)

(42) *nkw-snyii=ni* ***xikă*** *jyakàn* *^{0}xlyà=wiʔ*
C-grab=3.RESP few ear(.3) bread=AFMN
'He [=Jesus] grabbed **just a bit** of the crust of the bread.' (EML01)

These quantifiers also precede the noun they modify, and at least some non-numeral quantifiers can occur alongside numerals, as in (43).

[7] The Saint who Walks *joʔò ntyaʔan* is a periodic procession where church officials go from house to house in Tataltepec with an image of a Catholic saint allowing people to briefly venerate the saint in their homes and asking for a small donation in exchange.

xikă	'few'	*saskà*	'each'
chaka	'other'	*lkaa*	'all'
tykatya	'last'	*kataʔă*	'every'
kwleʔé	'half'	*tzá*	'one'
lakwàʔ	'whatever'	*xtì*	'few'
kwaʔnyá	'whatever'	*xkwiīʔ*	'nothing but'
^{0}taʔya	'many'		

Figure 7.4: Non-numeral quantifiers

(43) *kù n-tyee **kataʔă jakwā** servicio*
already C-finish(.3) every four service
'I served in **all four** positions.' (*lit.* 'all four services were finished') (SMJ01)

7.7 The pseudoclassifier

In many numeral phrases in Tataltepec Chatino, the lexeme *^{0}tyaʔa* appears between a quantifier and the enumerated noun or pronoun, as in (44) through (47). It must occur after a quantifier (typically a numeral), which suggests that it is not itself a quantifier.

(44) ***skwá ^{0}tyaʔa ktyuú** ^{0}ntinyà=nkuʔ jiʔìn*
six NCL hole H.make=3PL NSUB(.3)
'They make **six holes** in it [=a reed]' (ASP04)

(45) ***tkú ^{0}tyaʔa joón**=wiʔ*
two NCL rope=AFMN
'those **two ropes**' (ASP05)

(46) ***tyoòn ^{0}tyaʔa teʔ+tyja** n-^{0}tuʔù*
many NCL cloth+tortilla H-go_out(.3)
'There would be **many napkins**' (ASFM01)

(47) ***ní lkwa*** ***^{0}tyaʔa=na*** *ntuʔu=na* *loʔó xtyaʔán=na*
how many NCL=1IN C.go_out=1IN with mother=1IN
'**How many of us** were there with our mother?' (ASFM01)

This lexeme appears with quantifiers and numerals that indicate more than one, and is used with all countable nouns except for countable nouns which are being used as a measure word to enumerate a mass entity. Thus, this lexeme does not appear with nouns referring to units of measurement (distance, time, volume, etc. as in (48)-(52)) or abstract organizational units ('class, type', 'row'). A few enumerated nouns can appear with or without *^{0}tyaʔa*, such as 'money'. When referring to a sum of money or a mass of currency, 'money' does not appear with *^{0}tyaʔa*, but when referring, e.g., to a specific number of coins, *^{0}tyaʔa* is used.

(48) *ntzuʔu* *komo* ***kalá*** ***metro*** *ty-uú* *nteè* *nèʔ* *tya*
H.exist(.3) about twenty meter P-fall LOC:PROX stomach(.3) water
'There were about **twenty meters** he'd fall into the water.' (FMC03)

(49) ***kaʔyú tzaan*** *tykwiín ntè* *tz-^{0}aa=nkuʔ* *lóʔ* ***kaʔyú tzaan*** *tykwiín*
five day road LOC:PROX P-NB.go=3PL with five day road
ntè *ty-^{0}aan=nkuʔ*
LOC:PROX P-B.go=PL
'They go **five days** on this road, and **five days** coming back on this road.' (EPJ01)

(50) *tykwiīʔ alimento* *nty-akū* *cháʔ* ***sná*** ***jakwā*** ***^{0}kilò*** *teʔen* *ská* *soʔon*
pure animal_feed G-eat(.3) COMP three four kilogram heavy one hen
'They're only eating animal feed, because one hen weighs **three to four kilos**.'
(FMC02)

(51) ***tí*** ***⁰tykwà*** ***⁰milyà*** *nskwàʔ nty-iʔyá chònʔ ti ka ntè*
ten ADD.two maquila maize H-carry(.3) back(.3) LIM up_to LOC
yuwaʔ
La Huichicata
'She'd haul **twelve *maquilas*** of corn on her back all the way from La Huichicata.'

(1R18)

(52) *tzaʔnya ⁰tzaa x-kayáʔ=nkuʔ liʔ / **kaʔyú ⁰paxù***
cheap very PSD-payment=3PL then / five peso
'People's wages were very low then: **five *pesos***.' (ASP02)

This lexeme *⁰tyaʔa* then behaves very much like a classifier, in that it occurs in quantification contexts alongside enumerated nouns and quantifiers. Unlike canonical numeral classifiers, however, the lexeme does not subdivide the lexicon: there are no nouns which appear with a different lexeme in these contexts. For this reason I consider the lexeme to be a PSEUDOCLASSIFIER which has the form of a classifier, but does not appear to serve the same classificatory function. The *⁰tyaʔa* lexeme then seems to mark little beyond the [+ count] feature of the enumerated noun. One hypothesis (which remains to be rigorously tested) is that the lexeme serves a functional purpose in marking enumerated nouns which are somehow tangible, concrete, or referential (which would include all nouns referring to things which can be observed and counted) and would exclude those referents which either do not exist or are not referential in the same way. Under this hypothesis, the non-appearance of *⁰tyaʔa* with [- count] or [+ mass] measure words is then explained by the absence of multiple tangible referents of the measure word in either the pragmatic context; when one speaks of 'three cups of water', there need not be three (or any) containers present. This analysis is consistent with what speakers of Tataltepec Chatino have

told me: when asked what the difference between *sná ^{0}tyaʔa siʔyù* (three NCL tray) and *sná siʔyù* (three tray) was, Celiflora Cortés replied that the former referred to three separate trays, and while latter could also refer to three separate physical trays, it was their contents that was more relevant than the trays themselves to the discussion.

This construction is not present in any other Chatino language. While some Zapotec languages have been analyzed as having numeral classifiers of one or another kind, these are different in their details. Colonial Valley Zapotec's purported numeral classifiers were numerous and were used with 'one' as well as higher numerals (Córdoba, 1578), and Quiaviní Zapotec's use of a word used to distinguish between individual parts of an undifferentiated mass in a manner that appears similar to Tataltepec Chatino's *^{0}tyaʔa* uses a different lexeme ('leaf') for this function (Munro et al., 1999).[8] This construction is not a Tataltepec Chatino innovation, however, as Mixtec languages (especially representatives of the Coastal Mixtec dialect group) can be shown to be the source of Tataltepec Chatino's use of this construction (Sullivant, 2011c).

A word which means 'companion', 'sibling' or 'together' in other contexts can appear in numeral phrases in Coastal Mixtec languages. This word, which has a form like [tãʔã] occurs in numeral phrases with numerals greater than 'one' and is not used when the enumerated noun is a measure word or refers to time, distance, weight, volume. The term is only used with currency when the specific number of coins or bills is at issue (Sulli-

[8]There are only a few examples of *ndahg* 'leaf' being used in numeral phrases in Munro and Lopez's dictionary, and the only other terms labeled as numeral classifiers (such as *nehz* 'pair') are perhaps better analyzed as mensural classifiers (which specify number and arrangement) rather than sortal classifiers which divide the lexicon along semantic or functional lines. TAT and SLQZ are quite removed from each other genetically and geographically, and there is no evidence of a similar pseudoclassifier being used elsewhere in Zapotecan.

vant, 2012). Given the fact that Tataltepec de Valdés was subsumed under the Mixtec-speaking Yuku Dzaa empire (whose capital was located in what is now San Pedro Tututepec), and the similarity between the TAT forms for 'sibling' (*tyaʔà*) and the pseudoclassifier (*⁰tyaʔa*), it is argued that TAT calqued the use of 'companion' or 'sibling' in numeral phrases from their Mixtec neighbors.[9]

7.8 Personal pronouns

Tataltepec Chatino features a set of personal pronouns which can be used to express the argument of a verb, the possessor of a noun, or the object of a preposition (which itself is structurally similar to a possessed noun-possessor arrangement). These can be independent pronouns or dependent pronouns which are clitics and must be attached to their host. These person clitics are in most cases clearly derived from independent pronouns, as seen in Table 7.3.

The third-person pronouns are derived from common nouns indicating the hypernym of each grammatical class: *kiʔyú* 'man' led to *=yu* '3MASC', *naʔnì* 'animal' leading to *=nèʔ* '3.ANIMAL'. No common noun can be readily identified as the source of *=chóʔ* '3.FEM' or *=ni* '3.RESP ' which is used to refer to divine entities or highly respected people.

These person clitics are commonly found hosted on verbs to indicate their subject,

[9]Outside of Mesoamerica, this same kind of pseudoclassifier can be found in some Indo-Aryan languages, especially the Bihari languages such as Maithili and Bhojpuri, where authors either simply label the lexeme a 'classifier' or else describe it as a ``word which de-emphasizes the numeral''. The clearest examples of this come from Caribbean Hindustani, the mostly Bhojpuri-descended Indic speech of immigrant communities in the Caribbean, including Trinidad Bhojpuri and Sarnami Hindustani (Bosch, 1980; Mohan, 1978; Mohan & Zador, 1986). Unlike the Otomanguean examples, the Indo-Aryan pseudoclassifiers appear to be the residue of a more elaborate canonical numeral classifier system.

Gloss	Dependent clitic	Independent pronoun
1SG	*=naàʔ*	*naàʔ*
1EX	*=ya*	*kwa*
1IN	*=na*	*na*
2SG	*=noʔō*	*noʔō*
2PL	*=ma*	*kuʔma*
3.MASC	*=yu*	< *kiʔyu 'man'*
3.FEM	*=chóʔ*	---
3.ANIMAL	*=nèʔ*	< *naʔnì 'animal'*
3.RESP	*=ni*	---
3PL	*=nkuʔ*	< *nkuʔ 'people'*

Table 7.3: Tataltepec Chatino personal pronouns

immediately following an inalienably possessed noun or a relational/spatial noun to indicate its possessor or object. A number of these clitics have an incipient non-subject form which is typically formed from a contraction of the relational noun *jiʔìn* and the clitic, as seen in Table 7.4.[10] Of the non-subject contractions in Table 7.4 all except *=ʔná* can be used to indicate a possessor, an oblique, or an object: *=ʔná* can only be used to indicate the object of a verb.

Gloss	Non-subject form	Full non-subject form
NSUBJ.1SG	*=jnaàʔ*	*jiʔìn=naàʔ*
1SG.NSUBJ	*=ʔná*	---
NSUBJ.1IN	*=jiʔna*	*jiʔìn=na*
NSUBJ.2SG	*=jnoʔō*	*jiʔìn=noʔō*
NSUBJ.2PL	*=jiʔma, =ʔma*	*jiʔin=ma*

Table 7.4: Non-subject pronouns and contractions

These forms are considered clitics since they are phonologically dependent and can

[10]E. Campbell (2014, 215-217) describes this same kind of contraction (with a few different details) in Zenzontepec Chatino.

appear on words of many distinct lexical categories: verbs, inalienably-possessed nouns, relational/spatial nouns, quantifiers, and adjectives.

Chapter 8

The noun

This chapter will treat Tataltepec Chatino's nouns. First, § 8.1 will distinguish between the different subclasses of nouns present in the language, regular or alienably-possessed nouns (§ 8.1.1) and inherently-possessed or inalienably-possessed nouns (§ 8.1.2). Next, the inflection of inalienably-possessed nouns for their possessor will be detailed in § 8.2. Finally, some comments on the historical derivation of inalienably-possessed nouns from alienably-possessed nouns will be made in § 8.3.

8.1 Types of nouns

Nouns in Tataltepec Chatino can be classified as either an alienably- or an inalienably-possessed noun based on which of two sets of strategies for indication of a possessor is employed. The larger set are regular or alienably-possessed nouns. These nouns are not inherently possessed by something or someone nor do they have an essentially relational meaning. When a possessor is expressed, the noun, noun phrase, or personal clitic expressing the possessor is preceded by *jiʔìn* (e.g. *xnèʔ jiʔìn no piti* (dog NSUBJ NOM small.SG) 'the child's dog'). A smaller set of nouns are inalienably-possessed nouns, which are either inherently and necessarily possessed by someone or something or have an essentially re-

lational meaning.[1] The possessor of an inalienably possessed noun can also be expressed by a following noun, noun phrase, or person clitic, though the relational noun *jiʔìn* cannot precede the possessor in these cases (e.g. *steʔ (*jiʔìn) no piti* (clothing NSUBJ NOM small.SG) 'the child's clothing'). Additionally, inalienably-possessed nouns possessed by a first- or second-person singular possessor can express their possessor through a tone mutation and/or in the case of the first-person only a vowel mutation (e.g. *steʔ* 'clothes'→ *stènʔ* 'my clothes'). Alienably-possessed nouns show no special morphology, while some (but far from all) inalienably-possessed nouns appear to have a fossilized *s-*, *x-*, *xi-*, or *xki-* prefix, which may be the residue of a once-productive marking of a noun as possessed (e.g. *steʔ* 'clothing' < *lateʔ* 'cloth, rag'). Table 8.1 summarizes the syntactic, morphological, and semantic distinctions between the two sets of nouns.

	Alienably-possessed	Inalienably-possessed
Always possessed?	×	√
Marking of possession	__ *jiʔìn* $N_{POSSESSOR}$	__ $N_{POSSESSOR}$
2G/1SG possessor marked on stem?	×	√
Derivational morphology?	---	*s-*, *x-*, *xi-xki-*, ∅

Table 8.1: The noun alienability distinction

K. Pride and Pride (1970) identify a third subset of nouns: "nouns without possessors". These will be shown in § 8.1.4 to either be nouns formally indistinguishable from other nouns or else are adverbs mislabeled as nouns.

[1] Since a bare inalienably-possessed noun can be interpreted as having an unexpressed possessor, it is quite difficult to tell is a bare inalienably-possessed noun is semantically possessed or not. Jeff Rasch (p.c., 2015) reports a distinction between derived inalienably-possessed nouns (which show traces of a possessed prefix (§ 8.3)) which, in his experience, are always translated into Spanish as possessed and underived inalienably-possessed nouns which are not always translated as possessed. This distinction between derived and underived possessed nouns mirrors a syntactic distinction in many Zapotec languages.

8.1.1 Alienably-possessed nouns

Regular or alienably-possessed nouns include most of the nouns of the lexicon, and nearly all nouns not referring to human or animal body parts, or kinship or affinity relations. These nouns can be identified syntactically in that when possessed, their possessor is preceded by the relational noun *jiʔìn* or is indicated by a possessive personal clitic, which in almost all cases is a contraction of *jiʔìn* and the subject person clitics. (1) gives an example of a sentence where *santaru* 'soldier' is possessed by the noun phrase *nkuʔwyernu* 'government'[2] and *tuniʔi* 'home' (literally, 'doorway', built up from *tuʔwa* 'mouth' + *niʔi* 'house') is possessed by the first-person exclusive pronoun *kwa*. In both cases, since *santaru* and *tuniʔi* are alienably-possessed nouns, the relational noun *jiʔìn* precedes their possessor.

(1) ***tuniʔi jiʔìn=kwa*** *nkw-teʔen loʔó* *⁰yaan* *liʔ* ***santaru jiʔìn***
doorway NSUBJ=1EX C-lie(.3) when H.NB.go(.3) then soldier NSUBJ
nkuʔwyernu
government
'He was at **our house** when the **government's soldiers** were coming.' (1R18)

In addition to clear cases of person clitics preceded by *jiʔìn*, there are cases where these two lexemes have coalesced to form contractions that function as possessive pronouns, as with *jiʔna* (< *jiʔìn=na* NSUB=1IN) in (2).

(2) *kw-⁰aʔni=na knyá* ***jiʔna***
P-do=1IN work NSUBJ.1IN
'We do **our** work' (LQA01)

[2]This term is a folk etymology of Sp. *gobierno* 'government' wherein the first syllable is replaced by *nkuʔ* which means 'people' (cf. *nkuʔ cháʔ knyá* 'the Chatino people').

In (3), the possessor is Noé, who has already been mentioned in the sentence and is the topic of the discourse. As a topical third-person referent, no clitic pronoun is used for him, but the relational noun *jiʔìn* still appears after *xnèʔ* 'dog' to indicate that the dog belongs to someone, and in the absence of any noun or pronoun following *jiʔìn*, the third-person topic is presumed to be the possessor. The first instance of *jiʔìn* is not marking possession, but rather is marking the object of the verb phrase *nă* ^{0}*jlaa tìʔ*.[3]

(3) *nă* ^{0}*jlaa* *tìʔ* *Noé jiʔìn* ***xnèʔ jiʔìn***
NEG believe(.3) essence N. NSUBJ dog NSUB(.3)
'Noé$_i$ didn't believe **his**$_{i/*j}$ **dog**.' (ASP01)

Table 8.2 shows possessor marking of the alienably-possessed *tyja* 'tortilla' for all pronominal possessors. When no pronoun or NP follows *tyja jiʔìn* (tortilla NSUBJ(.3)) it is interpreted as possessed by a topical third-person entity in the discourse.

Person	Singular	Plural	
		Exclusive	Inclusive
1	*tyja jiʔìn=naàʔ*	*tyja jiʔìn=ya*	*tyja jiʔìn=na*
2	*tyja jiʔìn=noʔō*	*tyja jiʔìn=ma*	
3	*tyja jiʔìn*	*tyja jiʔìn=nkuʔ*	
MASC	*tyja jiʔìn=yu*		
FEM	*tyja jiʔìn=chóʔ*		
ANIMAL	*tyja jiʔìn=nèʔ*		
RESP	*tyja jiʔìn=ní*		

Table 8.2: Possessor inflection of an alienably-possessed word

[3] *Noé* is the possessor of *tìʔ* which is the subject argument of the verb ^{0}*jlaa*. In many Otomanguean languages, some psychological predicates are formed by expressions where a noun referring to an 'emotional center', 'heart', 'essence', or 'liver' appears to function as the subject of a verb stem. The noun's possessor is the notional subject of the sentence. Example (3) could be literally translated as 'Noé's emotional center didn't believe his dog'.

8.1.2 Inalienably-possessed nouns

The set of inalienably-possessed nouns in Tataltepec Chatino consists of body part terms---both body parts common to humans and many animals (e.g. *ike* 'head', *nèʔ* 'belly', *tanyì* 'blood') as well as body parts typically found on animals and not humans (e.g. *luʔwe* 'wing' and *xtyeʔen* 'tail')---traits which are closely linked to one's identity (e.g. *xtyiʔi* 'smell', *xkicháʔ* 'language', *⁰xtanyì* 'name'), physical artifacts like *steʔ* 'clothing', and many kinship and affinity terms such as *xtyaʔán* 'mother' and *snyiʔ* 'child'.

Tataltepec Chatino has a relatively small set of basic kinship terms,[4] though these are elaborated through compounding. All kin terms and many affines are inalienably possessed, but some compounds built from these terms are alienably-possessed, especially those involving the godparent-godchild terms *xtyaʔán/sti/snyiʔ tya/kcha* (mother/father/child water/illness) 'godparent/godchild by baptism/sponsorship during an illness'. (4) lists many of the inalienably-possessed kinship and affinity terms identified so far. It is worth noting that two of these *mpaà* 'co-father' and *⁰malì* 'co-mother' are loans from Spanish, and are the only inalienably-possessed loanwords.

[4]While a thorough study of Tataltepec Chatino's kinship system has not been undertaken (e.g. it is not clear if the term I gloss 'sister-in-law' refers to 'sibling's wife', 'spouse's sister', or both), it would appear to be a system in which co-lineal and non-colineal relatives are distinguished---meaning that parents are distinguished from aunts and uncles---but the distinction between one's sibling and one's cousins does not seem to be particularly salient in the language. The term *tyaʔà* 'companion' has been used in my corpus to refer to siblings as well as to cousins (though the loanwords *⁰primò* 'male cousin' and *⁰primà* 'female cousin' are more commonly used to refer to cousins). Grandparent terms are compounds literally meaning 'old mother' and 'old father', but 'grandchild' is a compound of 'child' and a term which is homophonous with *steʔ* 'clothing', which may or may not be its etymology. Sex is not normally distinguished in siblings or offspring, though there are native terms to disambiguate reference, as well as a native compound (literally 'birth companion') to disambiguate siblings from cousins. As far as I can tell, there is no distinction between sides of the family, though the asymmetry between 'brother-in-law' and 'sister-in-law' as well as 'son-in-law' and 'daughter-in-law' remains to be explained. Unlike many Zapotec languages, there is no special term for 'brother of male ego'.

(4) Inalienably-possessed kinship and affinity terms

xtyaʔán		'mother'
sti		'father'
xtyaʔán ^{0}*ksuʔ*	mother old	'grandmother'
sti ^{0}*ksuʔ*	father old	'grandfather'
chí tyaʔà	MASC:RESP sibling	'uncle'
maʔ tyaʔà	FEM:RESP sibling	'aunt'
tyaʔà		'sibling, cousin'
tyaʔà nkwlà	sibling birth	'sibling sharing both parents'
yu tyaʔà	MASC sibling	'male sibling or cousin'
chóʔ tyaʔà	FEM sibling	'female sibling of cousin'
snyiʔ		'child, son or daughter'
snyiʔ steʔ	child clothing?	'grandchild'
klyoʔo		'spouse'
chóʔ xtya	FEM ?	'sister-in-law'
kwlyaa	ANIM-church?	'brother-in-law'
sti laa	father church	'father-in-law'
xtyaʔán laa	mother church	'mother-in-law'
snyiʔ laa	child church	'son-in-law'
kwxèn		'daughter-in-law'
^{0}*malì*	< Sp. *comadre*	'co-mother'
mpaà	< Sp. *compadre*	'co-father'

When the possessor of these nouns is made explicit, the nominal or pronominal possessor is juxtaposed to the noun, with no intervening relational noun *jiʔìn*, as in (5) and (6).

(5) *nty-*^{0}*akùʔ ykwîʔ* ***steʔ*** ***no kiʔyú wiʔ*** *liʔ*
C-dress(.3) same clothing(.3) NOM male AFMN then
'He dressed himself in **the man's clothes**.' (ASP06)

(6) *lyeè tzaă nty-*^{0}*ka kuùʔ* ***steʔ=ya***
strong much H-be(.3) filth clothing=1EX
'**Our clothing** gets very dirty.' (SMJ02)

Inalienably-possessed nouns are even capable of expressing a first- or second-person sin-

gular possessor through tone and vowel mutations, as in (7) where *sti* 'father' is inflected for a second-person singular possessor (*stǐ* 'your father'), and (8) where it is inflected for a first-person singular possessor (*stèn* 'my father') (§ 8.2).

(7) *naàʔ ty-^{0}kwènʔ loʔó **stǐ** nǐ*
1SG P-talk.1SG with(.3) father.2SG AFF
'I'm going to talk to **your father**.' (1R16)

(8) *nkw-^{0}teèn xí yaka / nkw-^{0}teèn xí jiʔìn **jyoʔó** **stèn***
C-haul.1SG little_bit wood C-haul.1SG little_bit NSUBJ(.3) deceased father.1SG
'I hauled a little bit wood; I hauled a little bit for **my late father**.' (BGH02)

Table 8.3 shows the possessor-marking strategies of the inalienably-possessed *sti* 'father' for all pronominal possessors. Note that a first- or second-person singular possessors can be indicated by either ablaut (a tone sequence replacement for 2SG and a tone sequence replacement and vowel ablaut for 1SG) or by the direct attachment of a person enclitic. This choice of strategy is similar to the choice of 1SG or 2SG verb subject inflection (§ 9.2). When an inalienably-possessed noun occurs by itself, it is interpreted as having a (likely topical) third-person possessor which can be recovered from the discourse.

Many inalienably-possessed nouns have an alienably-possessed counterpart, which differ formally in that the inalienably-possessed noun often bears some kind of fossilized prefix (§ 8.3).

8.1.3 The alienability distinction in complex lexemes

The alienability of the head noun of a compound or complex lexeme indicates which set of possession strategies a compound noun may employ. Since compounds are left-

Person	Singular		Plural	
	Ablaut	Possessor Enclitics		
			Exclusive	Inclusive
1	*stèn*	*sti=naàʔ*	*sti=ya*	*sti=na*
2	*stǐ*	*sti=noʔō*	*sti=ma*	
3	*sti*		*sti=nkuʔ*	
MASC		*sti=yu*		
FEM		*sti=chóʔ*		
ANIMAL		*sti=nèʔ*		
RESP		*sti=ní*		

Table 8.3: Possessor inflection of an inalienably-possessed word

headed, this means that the ablaut inflection will occur on the rightmost stem in the compound, which might not itself be an inalienably-possessed noun nor a stem which is typically inflected for person. For example, the lexeme *sti* ^{0}*ksùʔ* (father old) 'grandfather' has as its head the inalienably-possessed noun *sti*, and as such overt possessors immediately follow the entire lexeme (i.e. *sti* ^{0}*ksùʔ=naàʔ* (father old=1SG) not **sti=naàʔ* ^{0}*ksùʔ* (father=1SG old) 'my grandfather') and without the use of *jiʔìn* as seen in (9).

(9) *no jyóʔ* ***sti+^{0}ksùʔ=naàʔ*** *nǐ ntz-uʔu* ^{0}*wata jiʔìn wiʔ*
NOM CL:DECEASED father+old=1SG AFF G-exist(.3) cattle NSUBJ(.3) AFMN
'**My** late **grandfather**, he had cattle.' (SMJ01)

The non-concatenative 1SG and 2SG inflections are also possible for such inalienably-possessed lexemes, though it is the last stem of the lexeme (*sti* ^{0}*ksònʔ* (father old.1SG)) which is inflected rather than the head (**stèn* ^{0}*ksùʔ* (father.1SG+old)), as seen in (10).[5] This may indicate of the non-concatenative possessor morphology suggests its historical

[5]Another logical possibility, that the possessor marking is present on all constituent stems of a lexeme (i.e. **stèn* ^{0}*ksònʔ* (father.1SG+old.1SG)) is not attested in complex lexemes like these.

guise as a clitic with a distribution similar to other person clitics.

(10) *nkw-aʔnì=naàʔ knyá loʔó* ***sti+ksònʔ***
C-do=1SG work with father+old.1SG
'I worked with **my grandfather**.' (SMJ01)

8.1.4 About "unpossessable" nouns

K. Pride and Pride (1970) identify a set of "nouns without possessors" (*sustantivos sin poseedor*), which are given in Table 8.4, but a comparison of these lexemes to my own analyses (under column TAT) show that these unpossessable nouns are either deictic day names (a-d) which are better analyzed as adverbs or prepositional phrases, or refer to entities which are pragmatically unlikely to be possessed (e-y). There is no formal criteria which distinguishes this second type of noun from regular alienably- or inalienably-possessed nouns.

8.2 Noun possessor inflection

As mentioned in § 8.1.2, inalienably-possessed nouns can be inflected for second-person or first-person singular possessors via tone sequence and/or (in the case of 1SG possessors) vowel mutations. Like verb subject inflection (§ 9.2), the 2SG forms differ from the base forms in tone sequence only, while 1SG forms may (or may not) differ from the base form in tone sequence, and always have a [+ nasal] feature. Like verb subject inflection, the /H͡L/ and /0/ tone sequences are most commonly found for the second-person singular, however, 1SG forms show different tendencies, though these patterns may be accidents of smaller number of tone inflection paradigms available for nouns. Table 8.5

	(K. Pride & Pride, 1970)	TAT	Gloss
a.	<bcha>	*wchá*	'day after tomorrow'
b.	<biʹyu>	*wiʔyú*	'three days from today'
c.	<la que>	*lakeè*	'tomorrow'
d.	<la ti>	*latí*	'day before yesterday'
e.	<clyooʹ>	*klyoòʔ*	'waves, current'
f.	<coo>	*koò*	'cloud'
g.	<cooʹ>	*koòʔ*	'moon, month'
h.	<cuañ<u>a</u> taa>	---	'rainbow' (snake + ?)
i.	<cualya>	*kwalya*	'fish, star'
j.	<nde cu<u>aa</u>>	*nte kwaàn*	'the sky (LOC 'high')'
k.	<cucuaʹ>, <cuaʹ>	*kwaʔ*	'dew'
l.	<cuii>	*kwii*	'Venus'
m.	<cuicha>	*kwchà*	'sun'
n.	<cuiʹ<u>i</u>>	*kweʔen*	'wind'
o.	<cuiʹ<u>i</u> xñaʹ<u>a</u>>	*kweʔen xnyaʔá*	'demon'
p.	<chalyuu>	*chalyuu*	'world'
q.	<chcu>	*tyku*	'well (n.)'
r.	<hora>	*^{0}orà*	'hour'
s.	<loo>	*loo*	'class, kind'
t.	<loyuu>	*lo yuū*	'territory, land'
u.	<quiyaʹ>	*kiyaʔ*	'while, bit of time'
v.	<tojoʹo>	*ṭjoʔò*	'pool, puddle'
w.	<tyiʹyu>	*tyiʔyú*	'lightning'
x.	<tyoo>	*tyoo*	'rain'
y.	<tyujoʹo>	*tyjoʔó*	'sea'

Table 8.4: Nouns without possessors in K. Pride and Pride (1970)

gives the frequency of each tone paradigm among the 34 simplex inalienably-possessed nouns in my corpus with an example word for each paradigm. Many nouns inflected for 1SG possessors have the same tone class as the base form (47%), similar to verbs where the base tone class is the same as the 1SG tone class in 47% (297/638) of verb forms in the dataset.

Tone Paradigm			Count	stem(.3)	2SG	1SG	Gloss
stem	2SG	1SG					
X	0	L	6	*klyoʔo*	*klyoʔǒ*	*klyoʔòn*	'spouse'
X	0	X	5	*sakaʔ*	*sakǎʔ*	*sakanʔ*	'cheek'
L	H͡L	H	4	*jyakàn*	*jyakān*	*jyakán*	'ear'
L	H͡L	L	4	*mpaà*	*mpaā*	*mpaàn*	'co-father'
H	H͡L	H	3	*loʔó*	*loʔō*	*loʔón*	'with'
H	H͡L	0-L	2	*xtyaʔán*	*xtyaʔān*	*⁰xtyaʔàn*	'mother'
0-L	H͡L	0-L	2	*⁰malì*	*malī*	*⁰malèn*	'co-mother'
0-X	0	0-L	2	*⁰ltzeʔ*	*ltzěʔ*	*⁰ltzènʔ*	'tongue'
H	H	H	2	*sloó*	*sloó*	*sloón*	'place'
L	H͡L	0-L	2	*nèʔ*	*nēʔ*	*⁰nèʔ*	'belly'
X	0	0-L	1	*siiʔ*	*siǐʔ*	*⁰seènʔ*	'side, ribs'
L	0	0-L	1	*yaàʔ*	*yaǎʔ*	*⁰yaànʔ*	'hand'

Table 8.5: Frequency of tone paradigms for possessor-inflected nouns

The following two sections will discuss the second-person singular (§ 8.2.1) and first-person singular (§ 8.2.2) possessor inflection paradigms in turn.

8.2.1 Second-person singular possessor

Much like with the tonal paradigms used to inflect second-person singular subjects on verbs, the number of possible tones on nouns inflected for second-person possessors is rather small. As with the verbs, 2SG-inflected nouns are almost always of tone class /0/ or /H͡L/, though a pair of lexemes has /H/-toned 2SG forms. Table 8.6 lists the attested paradigms and gives their frequencies in my corpus of non-compound inalienably-possessed nouns.

Notably, the 2SG-inflection for inalienably-possessed nouns follows the same pattern as 2SG-inflection for verbs: a stem of tone class /X/ or /0-X/ will have a 2SG form in /0/

Stem tone	2SG tone	Count	Percent of stem tone
X	0	12	100%
L	H͡L	10	90.9%
L	0	1	9.1%
H	H͡L	5	71.4%
H	H	2	28.6%
0-L	H͡L	2	100%
0-X	0	2	100%
Total	H͡L	17	
Total	0	15	
Total	H	2	

Table 8.6: Second-person singular possessor tone paragidms

and a stem of tone class /L/, /H/, or /0-L/ will have a 2SG form of tone class /H͡L/. Unlike with verbs, there are a few exceptions to this in my data: *yaà?* 'hand' has 2SG in /0/ rather than /H͡L/, and *sloó* 'place' and *xkalá* 'dream' have 2SG forms in tone class /H/ rather than /H͡L/ as part of their /H/ across-the-board inflection pattern.

8.2.2 First-person singular possessor

As with first-person subject inflection in verbs, a first-person inflected inalienably-possessed noun may appear with one of a number of tone sequences, including the tone sequence of the stem. These first-person inflected inalienably-possessed nouns also undergo nasal and vowel quality mutations, i.e. the 1SG forms of nouns will always have a nasal vowel of a lower quality than the final vowel of the stem. Table 8.7 lists the attested tone sequence alternations and gives the frequency of each in the small corpus of simplex inalienably-possessed nouns.

Though the corpus is small and therefore any generalizations are premature, some ob-

servations can be made. Stems of tone /X/ are most often either tonally unchanged in their 1SG form, or exhibit tone /L/. Stems of tone /L/ are most often either tonally unchanged or exhibit tone /H/ in their 1SG-inflected forms (i.e. there is a set which show tone sequence mutations and a set that does not), though nearly as many show tone class /0-L/. /H/-toned stems are more often than not also /H/-toned in their 1SG forms.

Stem tone	1SG tone	Count	Percent of stem tone
X	L	6	50.0%
X	X	5	41.7%
X	0-L	1	8.3%
L	H	4	36.4%
L	L	4	36.4%
L	0-L	3	27.3%
H	H	5	71.4%
H	0-L	2	28.6%
0-L	0-L	2	100%
0-X	0-L	2	100%
Total	L	10	
Total	H	9	
Total	X	5	
Total	0-L	1	

Table 8.7: First-person singular possessor tone paradigms

In addition to the tone sequence ablaut, all 1SG-inflected inalienably-possessed nouns have their final vowel undergo a change in nasalization and in vowel quality, as was seen in the forms in Table 8.5 where *saka?* 'cheek' → *sakan?* 'my cheek' and *sii?* 'ribs' → *seèn?* 'my ribs'. The high vowels /i u/ are lowered and nasalized /ẽ õ/ and non-high vowels /e a o/ are simply nasalized /ẽ ã õ/.[6] (11) formalizes this rule in which the vowel in a stressed

[6]There is only one exception. The 1SG form of *tì?* 'essence, emotional center' is *tàn?* not **tèn?*.

syllable becomes $\left[\begin{smallmatrix}+\text{nasal}\\-\text{high}\end{smallmatrix}\right]$ in the presence of an abstract tonal morpheme (whose exponent may also include a tone sequence replacement).

(11) First-person vowel ablaut

$$V_{\sigma_S} \rightarrow \begin{bmatrix}+\text{nasal}\\-\text{high}\end{bmatrix} \; / \_{=}T_{1SG}$$

8.3 Inalienably-possessed noun derivation

As mentioned in § 8.1, nouns in Tataltepec Chatino are either alienably or inalienably possessed. Where related pairs of alienably- and inalienably-possessed nouns exist, the inalienably-possessed noun often differs from the alienably-possessed noun by the presence of a *s-*, *x-*, *xi-*, or *xki-* prefix, as seen in (12).

(12) Inalienably-possessed nouns derived from alienably-possessed nouns

lateʔ	'rag'	*steʔ*	'clothing(.3)'
kiʔin	'excrement'	*seʔèn*	'excrement(.3)'
kalá	'dream'	*xkalá*	'dream(.3)'
kayàʔ	'payment'	*xkayàʔ*	'payment(.3)'
keè	'flower'	*xkeè*	'penis(.3)'
cháʔ	'language'	*xkicháʔ*	'language(.3)'
tya	'water'	*stya*	'fontanelle, vein(.3)'
ntaa	'bean'	*xintyaa*	'kidney(.3)'

In some cases, the addition of the inalienably-possessed morpheme leads to a non-transparent interpretation, as with *xkeè* 'penis' (e) derived from an expression literally meaning 'his flower'. In other cases, as far as I can tell the only distinction appears to be syntactic, as with *xkalá* 'dream(.3)' (c) and *xkayàʔ* 'payment(.3)' (d) which could be analyzed as *x-kalá* (PSD-dream(.3)) and *x-kayàʔ* (PSD-payment(.3)).

A fricative-initial prefix marking a possessed status is found throughout the Zapotecan languages. All extant Chatino topolects I am aware of have related pairs of alienably- and inalienably-possessed nouns similar to those in (12), and the process is at least somewhat productive among some Zapotec languages, where the possessed prefix can replace or cause a mutation in the noun's initial consonant, as in the Yalálag Northern Zapotec forms in (13) (Avelino Becerra, 2004, 14-15).

(13) a. *llen* → *x-chen=a'*
blood PSD-blood=1SG
'blood' / 'my blood'

b. *no'or* → *xo'or=a'*
woman PSD.woman=1SG
'woman' / 'my wife'

c. *be'kw* → *xi'kw=a'*
dog PSD.dog=1SG
'dog' / 'my dog'

Since many inalienably-possessed nouns across Zapotecan have no trace of any PSD prefix, we can presume that the ancestor language of Tataltepec Chatino had a core group of nouns which were inalienably possessed and indicated their possessor via direct juxtaposition ($N_{POSSESSUM}$ $N_{POSSESSOR}$) and the rest of the nouns were either inflected as possessed or were derived by a PSD prefix when they were possessed. Over time these derived possessed words were lexicalized (sometimes with unexpected semantics, as with 'PSD-bean' → 'kidney') as possessed nouns that used the possessor-marking strategies of the inalienably-possessed nouns. Since many of these derived inalienably-possessed nouns are widespread throughout the Chatino languages, many of them had been lexical-

ized by the Proto-Chatino stage. Since many Zapotec languages have a direct (NP NP) strategy and an indirect construction (NP POSS NP), and the word which intervenes between possessum and possessor is generally something like /ten/ which is plausibly cognate with *ji2ìn*, we can presume that both the direct and less direct strategies were present in Proto-Zapotecan.[7] We can speculate that the split between the common and idiomatic meanings reflects a crucial period in Pre-Chatino which both the inalienable and alienable possession strategies were available for some common nouns.

[7]The possessed prefix itself is likely of an even older vintage, as the Mixtecan Triqui languages use a fricative-initial prefix (called a "genitive prefix") to mark alienably possessed nouns, as in Itunyoso Triqui *si³-tʃi¹ ʔi¹-sih³* (GEN-illness-3SG.MASC) 'his illness' (DiCanio, 2008, 19).

Chapter 9

The verb

This chapter will discuss the Tataltepec Chatino verb and the inflectional processes affecting it. Verbs in Tataltepec Chatino are obligatorily inflected for a bundle of aspectual and/or modal features which are called aspects. An aspect has two exponents: a segmental component which is a (possibly null) prefix and a tonal component which is expressed through a paradigmatic system of tonal alternations between aspects. In addition to this aspect inflection, a verb can also be inflected for its subject. Table 9.1 shows all the possible (pronominal) subject and aspect inflections for the verb *-s-^{0}alà* 'open (it)'. Note that each of the four aspects features a distinct prefix, and most aspects feature different tone sequences on the base forms (which is the same as the 3SG which has a box drawn around it) of each verb, except for the habitual and potential which have the same tone sequence. For the 1SG and 2SG forms, there are two ways to indicate the subject, either by a person enclitic (where the base is the same as 3SG) or by a tone sequence and (in the case of 1SG) a vowel mutation. If the subject is expressed by an overt noun, noun phrase, or person clitic, that noun, noun phrase, or person clitic follows the verb, and is only separated from the verb stem by a post-verbal particles. If the subject is the first- or second-person singular, then the verb may be inflected for its subject by a tone mutation (which takes as its input the aspect-inflected stem's tone sequence) and/or the addition of a [+ nasal] feature.

	Singular		Plural	
		Exclusive		Inclusive
		Completive		
1	*nkw-s-^{0}alàn*	*nkw-s-^{0}alà=naà?*	*nkw-s-^{0}alà=ya*	*nkw-s-^{0}alà=na*
2	*nkw-s-alā*	*nkw-s-^{0}alà=no?ō*	*nkw-s-^{0}alà=ma*	
3	*nkw-s-^{0}alà*		*nkw-s-^{0}alà=nku?*	
MASC		*nkw-s-^{0}alà=yu*		
FEM		*nkw-s-^{0}alà=chó?*		
ANIMAL		*nkw-s-^{0}alà=nè?*		
RESP		*nkw-s-^{0}alà=ní*		
		Progressive		
1	*nx-alân*	*nx-alâ=naà?*	*nx-alâ=ya*	*nx-alâ=na*
2	*nx-alā*	*nx-alâ=no?ō*	*nx-alâ=ma*	
3	*nx-^{0}alà*		*nx-alâ=nku?*	
MASC		*nx-alâ=yu*		
FEM		*nx-alâ=chó?*		
ANIMAL		*nx-alâ=nè?*		
RESP		*nx-alâ=ní*		
		Habitual		
1	*n-s-^{0}alàn*	*n-s-^{0}alà=naà?*	*n-s-^{0}alà=ya*	*n-s-^{0}alà=na*
2	*n-s-alā*	*n-s-^{0}alà=no?ō*	*n-s-^{0}alà=ma*	
3	*n-s-^{0}alà*		*n-s-^{0}alà=nku?*	
MASC		*n-s-^{0}alà=yu*		
FEM		*n-s-^{0}alà=chó?*		
ANIMAL		*n-s-^{0}alà=nè?*		
RESP		*n-s-^{0}alà=ní*		
		Potential		
1	*∅-s-^{0}alàn*	*∅-s-^{0}alà=naà?*	*∅-s-^{0}alà=ya*	*∅-s-^{0}alà=na*
2	*∅-s-alā*	*∅-s-^{0}alà=no?ō*	*∅-s-^{0}alà=ma*	
3	*∅-s-^{0}alà*		*∅-s-^{0}alà=nku?*	
MASC		*∅-s-^{0}alà=yu*		
FEM		*∅-s-^{0}alà=chó?*		
ANIMAL		*∅-s-^{0}alà=nè?*		
RESP		*∅-s-^{0}alà=ní*		

Table 9.1: The verb *-s-^{0}alà* 'open (it)' conjugated

The following § 9.1 will describe the systems of aspect inflection acting on Tataltepec Chatino verbs, and § 9.2 will detail the inflection of verbs for first- and second-person singular subjects. Finally, § 9.3 will attempt to synthesize the different inflectional classes present in Tataltepec Chatino verbs.

9.1 Verb aspect inflection

This section will discuss the systems of aspect inflection of Tataltepec Chatino's verbs, dealing with segmental aspect prefixes (§ 9.1.1) and tonal aspect paradigms (§ 9.1.2) in turn, making comparisons to the cognate systems of other Chatino languages as relevant.

Outside of some compounds, all verbs in Tataltepec Chatino must appear inflected for aspect.[1] The exponents of aspect are segmental and tonal. Segmentally, aspect is encoded by a prefix , which depending on the verb's inflectional class and phonology may surface only as a mutation of the stem's initial consonant or be a null prefix. Tonally, depending on the tone sequence of the stem, there are a few common tone paradigms that, along with the prefix, determine the verb's aspect. For many verbs in Tataltepec Chatino, a verb's aspect can only be determined by its tone sequence.

These stems (unless they are to be incorporated into a compound verb) are then inflected for aspect. An aspect may have an overt segmental prefix (*nkw-toòn* (C-stand)) 'stood'), or an aspect prefix may be more abstract and bring about a mutation of a stem-initial consonant (by adding a secondary articulation, generally palatalization of coronals

[1] "Aspect" is the traditional term within Zapotecan linguistics for the morphological categories which encode a bundle of aspectual and modal values. I follow recent work on Chatino and Zapotec in calling these categories "potential", "habitual", "progressive", and "completive", even though these labels may be problematic as semantic descriptions.

(*^{0}tyoon* (P.stand) 'will stand'), but labialization of velars is also attested (cf. *nt-^{0}kanì* (H-invite) 'invites' and *^{0}kwanì* (P.invite) 'will invite')). A large and growing number of verbs have no prefix for the potential aspect (e.g. *∅-^{0}jnyà* (P-ask_for) 'will ask for').

In addition to the inflection through prefixes, verbs are also obligatorily inflected for aspect by paradigmatic alterations of the tone sequence of the verb stem. Thus, verbs of Tataltepec Chatino (and all Chatino languages, for that matter) have two exponents of aspect: a segmental prefix, and a characteristic tone sequence. [2] Once inflected for aspect, a stem may then be inflected for its subject. This can be indicated by appending a person clitic to the verb or following the verb with a noun phrase. If there is no overt subject, the subject will be interpreted as being some topical non-speech act participant. If the subject is 1SG or 2SG, a speaker can either append the corresponding person clitics or directly inflect the verb for its subject by tone sequence and (in the case of 1SG only) vowel mutations. This strategy of person inflection is a paradigmatic system of tone sequence alternations similar to the tonal aspect inflection paradigms, and they take the tone of the bare aspect-inflected stem as their input. This tone (and vowel) mutation inflection cannot co-occur with a person clitic, but can co-occur with a fronted focused independent pronoun.

Figure 9.1 shows the derivation and inflection of a single verb form, *n-x-^{0}akòn* (H-CAUS-eat.1SG) 'I feed'. The verb root can receive a *s-* or *t-* transitivity prefix which can

[2] If I were to be extremely precise in my analysis of Tataltepec Chatino verbs, I would have to indicate that a verb like *n-x-akú* 'fed it' must be analyzed as G-CAUS-G.CAUS.eat(.3) since the progressive aspect has both a segmental exponent (*n-*) and a tonal exponent (the /H/ tone sequence). Furthermore, the aspect-uninflected stem *-x-akú* must be glossed as -CAUS-CAUS.eat since the /H/ tone sequence is the result of its derivation from *-aku* 'eat' which has a /X/ tone sequence. In practice, I will not gloss this double inflection, identifying aspects by prefixes where these are separable (i.e. *n-s-^{0}alà* H-CAUS-open) or as being fused with the stem or another prefix when they are not (i.e. *nx-alâ* G.CAUS-open).

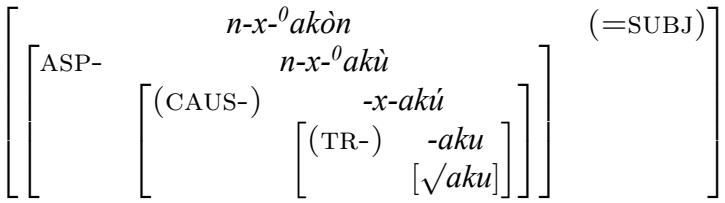

Figure 9.1: Verb derivation and inflection scheme

derive a transitive verb stem from a root. The root in this example, *-aku* 'eat' does not receive a transitivity prefix, yielding the verb stem *-aku* 'eat' which can be inflected for aspect and person. Instead, this example shows the verb stem receiving the causative prefix *x-* which is accompanied by a replacement of the verb stem's tone sequence with /H/ giving the stem *-x-akú* 'feed', which must be inflected for aspect in order to create a well-formed verb. In this example, the verb will be inflected for the habitual aspect, which for this verb's prefix inflectional class is indicated by an *n-* prefix and by it's tonal inflection class by a replacement of the /H/ tone sequence with the /0-L/ sequence, yielding the verb *n-x-⁰akù* 'feeds'. While this is a well-formed verb in the language, it is also the input for the tonal/vowel ablaut inflection for 1SG and 2SG subjects. 1SG subject inflection has two exponents, a replacement of the verb stem's tone sequence (which in this case is null, as the /0-L/ is the same tone sequence of the base form of the verb and the 1SG form) and a modification of the stressed vowel's $\left[\begin{smallmatrix}\pm\text{ nasal}\\ \pm\text{ high}\end{smallmatrix}\right]$ features to $\left[\begin{smallmatrix}+\text{ nasal}\\ -\text{ high}\end{smallmatrix}\right]$, which converts the /u/ vowel to /õ/ yielding *n-x-⁰akòn* 'I feed'.

The rest of this section will discuss aspect inflection first through a treatment of its segmental exponents § 9.1.1 then its tonal exponents § 9.1.2 and finally will lay out the inflectional classes relevant for verb aspect in Tataltepec Chatino.

9.1.1 Segmental prefixes

While every effort has been made to identify inflectional classes on Tataltepec Chatino-specific criteria, the classes are nevertheless named and arranged to facilitate comparison to the verb classifications performed for other Chatino languages (E. Campbell, 2011; Villard, 2009) as well as the large body of work on Zapotec languages following Kaufman (1993-2007).

A brief summary of other verb classification of Proto-Zapotecan is in order. The Proto-Zapotec verb classed (Kaufman, 1993-2007) are summarized in (1). The Proto-Zapotec verb classes are distinguished by their choice potential and completive aspect allomorphs, and the presence or absence of replacive theme consonants.

(1) Proto-Zapotec verb classes

	A	B	C	D
POT	**ki-*	**ki-*	**k-*	**k-*
COMPL	**kwe-*	**ko-*	**ko-*	**ko-*
Replacives?	×	×	×	√
Stem begins with	V	C	V,C	V, *s

The first class is Class A, which are more transitive stems which historically were identified by a *kwe- completive prefix and or *ki- prefixes on potential verbs.[3] Class B are the less transitive counterparts of the Class B verbs, and feature *ki- prefixes on Potential verbs, most of which have been lost in the Tataltepec Chatino reflexes of Class B verbs, leaving only the palatalization of the stem-intitial consonant as a marker of that as-

[3] All non-potential aspects in Chatino save the *y-* COMPL allomorph of some topolects (as well as many aspects of some Sierra Sur Zapotec languages (Beam de Azcona, 2014) have a nasal accretion on their aspect prefixes. Kaufman (1993-2007) posits that this nasal descends from a Proto-Otomangue adverb *na 'now'.

pect. Class C verbs have *k- Potential prefixes and *ko- Completive prefixes. Zapotec also has a Class D which are notable for having "replacive" (REPL) theme consonants which substitute the stem-initial consonant (or are added to a vowel-initial stem) in certain aspects, a phenomenon that is entirely absent from Chatino.

More illuminating for the study of verb classes in Chatino are the classifications of verbs in Zenzontepec Chatino (E. Campbell, 2011) and Zacatepec Eastern Chatino (Villard, 2009). Since these topolects are quite conservative with regard to the consonants of their prefixes (which, being in unstressed, non-root syllables have been greatly reduced in Tataltepec Chatino), they provide a guide for identifying and classifying Tataltepec Chatino verbs according to segmental prefixes in cases where morphophonological alterations have made the verbs difficult to place in to one bin or another. Both of these classifications (and my own below) follow Kaufman (1993-2007) in classifying verbs according to their segmental aspect prefixes and in labeling these with letters (A, B, and C). All classifications of Chatino find it necessary to sub-divide these classes, which are given a secondary label that either indicates the typical initial segment of the stems of a class (e.g. class By have *y*-initial stems) or with a number if there is no clear generalization that can be made (as with classes A2 and C2).

For Zenzontepec Chatino, E. Campbell (2011, 229) identifies seven prefix inflection classes, which can be grouped into three superordinate classes that correspond to three of the classes Kaufman identified in Zapotec. (2) shows these classes with their respective allomorphs of the aspect prefixes.

(2) Zenzontepec Chatino prefix inflectional classes

Class	Completive	Progressive	Habitual	Potential
Au, Ac	*nka-*	*nte-*	*nti-*	*ki-*
A2	*nkwi-*	*nte-*	*nti-*	*ki-*
Bc	*nku-*	*nte-*	*nti-*	*ki-*
Bt	*nku-*	*nte-*	*n<y>-*	*<y>-*
By	*nk-*	*nte-*	*nch-*	*ch-*
C	*nku-*	*nch-*	*nti-*	*k-*
C2	*nka-y-, y-*	*ntey-, nch-*	*nti-*	*k-*

The A classes contain transitive verbs with the POT prefix *ki-*, PROG prefix *nte-*, and HAB prefix *nti-*. Class Au/Ac (which either have *u*-initial or consonant-initial stems and only differ superficially) has the *nka-* COMPL prefix while Class A2 has *nkwi-*. The B classes contain mostly intransitive, consonant-initial verbs with *nte-* PROG prefix and *nku-* or *nk-* for their COMPL prefix. Class Bc has consonant-initial stems and the *ki-* POT and *nti-* HAB prefixes. Class Bt verbs have *t*-initial stems whose interactions with the POT and HAB prefixes have lead to different allomorphs: POT is indicated by the palatalization of the stem-initial *t* and HAB features a nasal prefix and the palatalization of the stem-initial consonant (*n<y>-* in the symbolism of this volume). Class By features stems beginning with the intransitivizing prefix *y-*, which has fused with many aspect prefixes to create a particular set: *nk-* for COMPL, *nte-* for PROG, *nch-* for HAB and *ch-* for POT. The C classes are made up of vowel-initial stems which take the *k-* POT prefix, the *nti-* HAB prefix, and *nte-y-* or *nch-* as the PROG prefix. Class C has only *a*-initial stems and takes the *nku-* COMPL prefix and Class C2 has vowel-initial stems (including *a*-initial stems) and takes a *y-* or *nkay-* (likely a double marking (*nka-y* C-C-) of aspect) COMPL prefix.

Applying the same analytical framework used by Kaufman and Campbell to Zacatepec Eastern Chatino, Villard (2009, 6) finds nine prefix inflection classes that correspond

to the three superordinate A, B, and C groups found for Proto-Zapotec and Zenzontepec Chatino. (3) shows these classes with their respective allomorphs of the aspect prefixes.

(3) Zacatepec Eastern Chatino prefix inflection classes

Class	Completive	Progressive	Habitual	Potential
Au	*nka-*	*nta-*	*nti-*	*k-*
Ac	*nka-*	*nta-*	*nti-*	<*y*>-
A2	*nkwi-*	*nta-*	*nti-*	<*y*>-
Aj	*nka-*	*nta-*	*nti-*	∅-
Bk	*n-*	*nta-*	*nti-*	*ti-*, ∅-
Bc	*nku-*	*nta-*	*nti-*	<*y*>-
By	*nk-*	*nti-k-*	*nk-*	*k-*
C	*nku-*	*nky-*	*nti-*	*k-*
C2	*nka-y-*, *y-*	*nky-*	*nti-*	*k-*

The A classes are formed of transitive verbs which take *nta-* PROG and *nti-* HAB prefixes. Classes Au and Ac are very similar to Zenzontepec Chatino's in that their verbs begin with either a transitivizing *u-* prefix or a consonant and take the *nka-* COMPL prefix, which is also used by Class Aj. Class Au has the *k-* POT prefix and Class Ac indicates the POT aspect by the palatalization of the stem-initial consonant. Class A2 also marks its POT this way, but has a *nkwi-* COMPL prefix. Class Aj has a null POT prefix. The B classes take the *nta-* or (for Class By) *nti-k-* PROG prefixes and the *nti-* HAB prefix. The *k*-initial verbs of Class Bk has either ∅- or *ti-* for POT prefix and has a *n-* COMPL prefix. Class By, whose stems begin with the intransitivizing prefix *y-*, takes the *nk-* COMPL prefix, the *nti-k-* PROG prefixes, the *nk-* HAB prefix , and the *k-* POT prefix. The verbs of Class Bc indicate their POT-inflected verbs through a palatalization of the stem-initial consonant and have the *nku-* COMPL prefix. The vowel-initial verbs of the C classes takes the *k-* POT prefix , the *nti-* HAB prefix , and the *nky-* PROG prefix . The /a/-initial stems

of Cclass C take the *nku-* COMPL prefix and Class C2 takes either *y-* or *nka-y-* as their COMPL prefixes.

The agglutinative nature of verb aspect inflection suggested by these classification schemes is not easily recoverable for Tataltepec Chatino where non-prominent vowel syncopation has lead to the elimination of nearly every prefix vowel, giving rise to consonant clusters which were then suffered further changes. Therefore, each of the major classes has a number of subclasses which are determined by the morphophonemics of the verb stems, chiefly by the character of the stem-initial consonant. The following classification of Tataltepec Chatino verbs is a continuation of my earlier work on this topic (Sullivant, 2011a), and corrects some errors and oversights present there.

(4) provides a summary of the verb classification of Tataltepec Chatino according to the forms of the particular set of aspect prefixes a given verb takes. There are ten prefix inflectional classes which can be grouped into three superordinate sets much like the prefix inflectional classes of Zenzontepec Chatino and Zacatepec Eastern Chatino. Since many aspect prefixes have been greatly affected by morphophonological alterations, some prefixes affect the initial consonant of the verb stem they are attached to. Many prefixes bring about the palatalization of a stem-initial coronal and a few bring about the labialization of a stem-initial velar. These properties are represented as <*y*>- and <*w*>- respectively.

(4) Tataltepec Chatino prefix inflectional classes

Class	Completive	Progressive	Habitual	Potential
Au	*nkw-*	*nt<y>-*	*nt-*	*kw-*
As	*nkw-*	*n<y>-*	*n-*	*∅-*
A2	*nkw<y>-*	*nty-*	*n<y>-*	*kw<y>-*
Bc	*nkw-*	*n<y>-*	*n<y>-*	*<y>-*
Bt	*n-*	*n<y>-*	*n-*	*∅-*
Bl	*n<w>-, n-*	*nk<y>-*	*nk<y>-*	*k<y>-*
Bk	*nkw-*	*nty-*	*nt-*	*ty-, ∅-*
By	*nty-*	*nty-*	*nty-*	*ty-*
C1	*nkw-*	*nty-*	*nty-*	*k-*
C2	*nty-*	*nty-*	*nt-*	*k-*

The following sections will discuss each of these prefix inflectional classes in turn.

9.1.1.1 The A classes

The A classes contain mostly transitive verbs that have their POT prefix in *kw-*, *kw<y>-*, or ∅, and take their COMPL in *nkw-* or *nkw<y>-*. There are three A classes, Au, As, and A2, whose aspect prefixes are listed in (5).

(5) The A classes

Class	Completive	Progressive	Habitual	Potential
Au	*nkw-*	*nt<y>-*	*nt-*	*kw-*
As	*nkw-*	*n<y>-*	*n-*	*∅-*
A2	*nkw<y>-*	*nty-*	*n<y>-*	*kw<y>-*

9.1.1.1.1 Class Au The first notable subclass of Tataltepec Chatino's Class A verbs is Class Au. Most of these verb stems, which today are consonant-initial, are descended from historic stems of the form *u-CVCV where *u- was a transitivity-increasing prefix. In contemporary Tataltepec Chatino, this historic *u is no longer part of the verb stem,

but has been fused to the COMPL and POT prefixes. (6) shows some examples of verbs of Class Au. Verbs like -^{0}*inyà* 'make something' (a) and *-jyú* 'punch a hole' (b) show the canonical prefixes (*nkw-*, *nty-*, *nt-*, *kw-*) in their clearest form.

(6) Verbs of Class Au

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	-^{0}*inyà*	'make s.t.'	*nkw-*^{0}*inyà*	*nty-inyâ*	*nt-*^{0}*inyà*	*kw-*^{0}*inyà*
b.	*-jyú*	'punch a hole'	*nkw-jyú*	*nty-jyú*	*nt-*^{0}*jyù*	*kw-*^{0}*jyù*
c.	*-teèn*	'haul'	*nkw-teèn*	*ntyeēn*	*n-*^{0}*teen*	*kw-*^{0}*teen*
d.	*-soón*	'fight'	*nkw-soón*	*nxoón*	*n-soón*	*kw-soón*
e.	*-lakwá*	'clear a field'	*nkw-lakwá*	*nklyakwá*	*nk-*^{0}*lakwà*	*kw-*^{0}*lakwà*
f.	-^{0}*loʔo*	'run off'	*nkw-*^{0}*loʔo*	^{0}*nklyoʔo*	*nk-*^{0}*loʔo*	*kw-*^{0}*loʔo*
g.	-^{0}*jlya*	'separate cotton'	*nkw-*^{0}*jlya*	*nk-*^{0}*jlya*	*nk-*^{0}*jlya*	*kw-*^{0}*jlya*

For many stems, the PROG and HAB prefixes have fused with the initial stem consonant, as with *ntyeēn* 'G.haul' (c), *nxoón* 'G.fight' (d), *nk-*^{0}*lakwà* 'H-clear_field' (e) and *nk-*^{0}*loʔo* 'H-run_off' (f). For these verbs, the PROG is indicated by an *n-* prefix and the palatalization of the stem-initial consonant (*n*<*y*>-), and the HAB is indicated by a *n-* prefix alone. Note that forms like *n-*^{0}*teen* 'H-haul' (c) contain singleton stops (/n-tɛ̃:$^{0\text{-}X}$/ → [^{n}dɛ̃:]) and not geminate stops (*/nt-tɛ̃:$^{0\text{-}X}$/ → [^{n}tɛ̃:]), showing the coalescence of the respective stops into one.

The forms of the prefixes for stems beginning with coronal sonorants like *-lakwá* 'clear a field' (e), -^{0}*loʔo* 'run off' (f) and -^{0}*jlya* 'separate cotton' (g) are somewhat different owing to the dissimilation of coronal stop-sonorant sequences in Tataltepec Chatino. Thus, the PROG and HAB prefixes for *l* or *n* initial stems (or stems beginning with /hl/ or /hn/ clusters as seen in -^{0}*jlya* (g)) are *nk*<*y*>- and *nk-*, with the palatalization of the stem-initial coronal for PROG-inflected stems.

9.1.1.1.2 Class As An even larger set of Class A verbs are the Class As verbs, so called because of the coronal fricatives (*s, x*) which begin the stems of most Class As verbs, some of which are exhibited in (7).

(7) Verbs of Class As

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-s-^{0}alà*	'open'	*nkw-^{0}salà*	*nxalâ*	*n-^{0}salà*	*∅-^{0}salà*
b.	*-s-^{0}alu*	'throw'	*nkw-^{0}salu*	*nxalŭ*	*n-^{0}salù*	*∅-^{0}salù*
c.	*-seén*	'squeeze'	*nkw-seén*	*nxeén*	*n-^{0}seèn*	*∅-^{0}seèn*
d.	*-siʔyú*	'cut'	*nk-siʔyú*	*nxiʔyú*	*n-^{0}siʔyù*	*∅-^{0}siʔyù*
e.	*-skwan*	'pull, yank'	*nk-skwan*	*nxkwān*	*n-skwan*	*∅-skwan*
f.	*-jnyá*	'ask for s.t.'	*nkw-jnyá*	*n-jnyá*	*n-^{0}jnyà*	*∅-^{0}jnyà*
g.	*-jnyìʔ*	'borrow'	*nkw-jnyìʔ*	*n-jnyīʔ*	*n-^{0}jnyiʔ*	*∅-^{0}jnyiʔ*
h.	*-x-akí*	'tilt'	*nkw-x-akí*	*n-x-akí*	*n-x-^{0}akì*	*∅-x-^{0}akì*
i.	*-x-akú*	'feed'	*nkw-x-akú*	*n-x-akú*	*n-x-^{0}akù*	*∅-x-^{0}akù*
j.	*-x-^{0}kinya*	'move s.t.'	*n-x-^{0}kinya*	*n-x-kinyă*	*n-x-^{0}kinya*	*∅-x-^{0}kinya*
k.	*-x-k-utzèn*	'scare s.o.'	*n-x-k-utzèn*	*n-x-k-utzēn*	*n-x-k-^{0}utzen*	*∅-x-k-^{0}utzen*

Like Class Au verbs, they exhibit a *nkw-* COMPL prefix, except for a subset of these where the prefix has been reduced to *nk-* or *n-*. The *n<y>-* PROG and *n-* HAB prefixes both consist of a nasal segment but differ in their effects on the initial consonant of the stem. Class As has a null POT prefix. The verbs *-s-^{0}alà* 'open (it)' (a), *-s-^{0}alu* 'throw, spill (it)' (b), and *-seén* 'squeeze' (c) show the canonical prefixes (*nkw-*, *n<y>*, *n-*, *∅*) in their clearest form.

A large number of the verbs of Class As are derived causative verbs, either derived by the older *s-* transitivity-increasing prefix, as with *-s-^{0}alà* (a) and *-s-^{0}alu* (b), or the more recent *x-* causative prefix as seen with *-x-akí* 'tilt it' (h), *-x-akú* 'feed' (i), *-x-^{0}kinya* 'make it move' (j), and *-x-k-utzèn* 'frighten (it)' (k). Since the initial consonant of the *x-* initial stems is already palatalized, the palatalization of the PROG inflection applies vacuously,

resulting in PROG and HAB stems of these verbs being segmentally identical (f-k). A few As verbs such as *-jnyá* 'ask for' (f) and *-jnyìʔ* 'borrow' (g) actually begin with a glottal fricative-nasal cluster, but exhibit the same aspect prefix inventory as the other As verbs.

A number of the Class As verbs such as *-siʔyú* 'cut it' (d) and *-skwan* 'pull, yank' (e) show reductions of the COMPL prefix from *nkw-* to *nk-*, and other such as *-x-^{0}kinya* (j) and *-x-k-utzèn* (k) show a further-reduced *n-* COMPL prefix. Not only does this reduction simplify the complexity of these onsets (from large /NC-C(C)/ clusters to more common /N-C(C)/ clusters), it also bring Class As verbs into line with Class By, the very large set of intransitive verbs in having the same segmental prefix for COMPL, PROG, and HAB stems, with only the POT having a distinct prefix.[4]

9.1.1.1.3 Class A2 A very small number of verbs begin with *nkw* in the COMPL and *kw* in the POT like Class Au verbs, but differ from Au verbs in that these prefixes cause the palatalization of stem-initial consonants and are therefore *nkw<y>-* and *kw<y>-* respectively. This palatalization can be explained by the historic high front vowel found in this class's *nkwi-* COMPL prefixes in ZEN and ZAC. (8) shows both examples of this verb class *-atzàʔ* 'wet it' (a) and *-atzù* 'break it' (b).

[4]Though there is evidence that the stop *ty* is part of the prefix and not the uninflected verb stem, a reanalysis of this *ty* as part of the stem would bring Class By into even closer agreement with this subset of reduced Class As verbs: the COMPL, PROG, and HAB prefixes for each would be *n-*, and the POT would have no prefix.

(8) Verbs of Class A2

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-atzà?*	'wet (tr.)'	*nkwchà?*	*nty-atzā?*	*^{0}nchà?*	*^{0}kwchà?*
b.	*-atzù*	'break (tr.)'	*nkwchù*	*nty-atzū*	*^{0}nchu*	*^{0}kwchu*

These verbs have the PROG prefix *nty-* and *n<y>-* on their syncopated HAB stems. As will be discussed in § 9.1.1.4 below, this class was formerly larger in the Chatino languages but has been reduced as verb stems migrate out either through morphological change, or as a result of syncopation's obscuring historic forms. For example, the non-syncopated PROG forms such as *nty-atzā?* 'G-wet' which preserve the unpalatalized stem consonant *tz* are the only reason these verbs form a distinct class. Should the PROG forms be syncopated, the stem consonant will be palatalized (i.e. *nchā?* G.wet), and Class A2 verbs would be indistinguishable from Class Au verbs following a reanalysis of their stems (e.g. the transitive stem of 'wet' would be *-chà?* not *-atzà?* and have the prefixes *nkw-*, *n(<y>)-*, *n-*, *kw-*).

9.1.1.2 The B classes

The verbs of the B classes are typically intransitive verbs and generally indicate activity verbs. These verbs typically have a *nkw-* or a *nty-* COMPL prefix, and their POT prefix is either *ty-*, *<y>-*, or is null, as is shown in (9).

(9) Class B prefixes

Class	Completive	Progressive	Habitual	Potential
Bc	*nkw-*	*n<y>-*	*n<y>-*	*<y>-*
Bt	*n-*	*n<y>-*	*n-*	*∅-*
Bl	*n<w>-, n-*	*nk<y>-*	*nk<y>-*	*k<y>-*
Bk	*nkw-*	*nty-*	*nt-*	*ty-, ∅-*
By	*nty-*	*nty-*	*nty-*	*ty-*

9.1.1.2.1 Class Bc The consonant-initial Bc Class has a *nkw-* COMPL prefix and a <*y*>- POT prefix which is realized by the palatalization of the coronal stem-initial consonant. The PROG and HAB aspects are both indicated by the prefix *n*<*y*>- which appears as a *n-* followed by a palatalized form of the stem-initial consonant, as seen in the forms in (10).

(10) Verbs of Class Bc

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-siʔyú*	'cut (intr.)'	*nkw-siʔyú*	*nxiʔyú*	*⁰nxiʔyù*	*⁰xiʔyù*
b.	*-sná*	'run'	*nkw-sná*	*nxná*	*⁰nxnà*	*⁰xnà*
c.	*-stí*	'laugh'	*nkw-stí*	*nxtyí*	*⁰nxtyì*	*⁰xtyì*
d.	*-taʔan*	'go about/walk'	*nkw-taʔan*	*ntyaʔān*	*ntyaʔan*	*tyaʔan*
e.	*-takwí*	'hang, float'	*nkw-takwí*	*ntyakwí*	*⁰ntyakwì*	*⁰tyakwì*
f.	*-tuùʔ*	'cough'	*nkw-tuùʔ*	*ntyuūʔ*	*⁰ntyuuʔ*	*⁰tyuuʔ*
g.	*-tzaʔan*	'fill'	*nkw-tzaʔan*	*nchaʔān*	*nchaʔan*	*chaʔan*
h.	*-tzaʔán*	'change'	*nkw-tzaʔán*	*nchaʔán*	*⁰nchaʔàn*	*⁰chaʔàn*

These verbs features stems which begin with *s* like *-siʔyú* 'get cut' (a), *-sná* 'run' (b), and *-stí* 'laugh'(c); with *t* like *-taʔan* 'walk' (d), *-takwí* 'hang, float, fly' (e), and *-tuùʔ* 'cough' (f); or with *tz* like *-tzaʔan* 'fill' (g) and *-tzaʔán* 'change' (h). They often describe less transitive events and activities, and a number of postural verbs are counted in the ranks of Class Bc.

9.1.1.2.2 Class Bt Closely related to Class Bc is Class Bt, which is similar to Bc except for the absence of a POT prefix, and the simple *n-* COMPL prefix. Some examples of verbs of this class can be found in (11).

(11) Verbs of Class Bt

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-t-akín*	'burn it'	*n-t-akín*	*nty-akîn*	*n-t-^{0}akìn*	*∅-t-^{0}akìn*
b.	*-t-akónʔ*	'cover'	*n-t-akónʔ*	*nty-akónʔ*	*n-t-^{0}akònʔ*	*∅-t-^{0}akònʔ*
c.	*-taʔyá*	'go down'	*n-taʔyá*	*ntyaʔyá*	*n-^{0}taʔyà*	*∅-^{0}taʔyà*
d.	*-twé*	'slice'	*n-twé*	*ntywé*	*n-^{0}twè*	*∅-^{0}twè*
e.	*-^{0}tkuneʔè*	'push'	*n-^{0}tkuneʔè*	*ntykuneʔê*	*n-^{0}tkuneʔè*	*∅-^{0}tkuneʔè*
f.	*-taá*	'give'	*n-taá*	*ntyaá*	*n-^{0}taà*	*∅-^{0}taà*

Besides the minor differences in choice of aspect prefix allomorphs, Class Bt verbs differ from Class Bc verbs in that they are more transitive and some of these, such as *-t-akín* 'burn it' (a) and *-t-akónʔ* 'cover' have the transitivizing *t-* prefix. Others such as *-taʔyá* 'go down' (c) and *-^{0}tkuneʔè* 'push' (e) may also have this prefix, though the absence of a less-transitive counterpart makes this difficult to identify. The less-transitive counterparts of many of these verbs are found in Class By. Some of these Class Bc verbs appear to have migrated here relatively recently, as K. Pride and Pride (1970) give the COMPL of *-taá* 'give' as <ngutaa> (presumably /nku-ta:/ or /nk^{w}-ta:/). The verb 'give' is in an A class in other topolects' verb classifications.

9.1.1.2.3 Class Bl Class B verbs which begin with the lateral *l* belong to Class Bl. Like Class Bc verbs, these have the *nkw-* COMPL prefix and the *nt<y>-* prefix for the PROG and HAB prefixes, though given the dissimilation of coronal stop-sonorant sequences in Tataltepec Chatino, PROG- and HAB-inflected stems of Class Bl verbs begin with the cluster *nkly*. Distinct from Class Bc verbs, the POT prefix for Class Bl verbs is *k<y>-*, which palatalizes the stem-initial *l*, meaning both that the POT-inflected Class Bl verbs begin with the cluster *kly*. (12) shows some examples of verbs of Class Bl.

(12) Verbs of Class Bl

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-laà*	'get loose'	*nkw-laà*	*nklyaā*	*^{0}nklyaà*	*^{0}klyaà*
b.	*-lajá*	'get swept'	*nkw-lajá*	*nklyajá*	*^{0}nklyajà*	*^{0}klyajà*
c.	*-lakwán*	'bless (intr.)'	*nkw-lakwán*	*nklyakwán*	*^{0}nklyakwàn*	*^{0}klyakwàn*
d.	*-lakwén*	'earthquake'	*nkw-lakwén*	*nklyakwén*	*^{0}nklyakwèn*	*^{0}klyakwèn*
e.	*-lakwí*	'boil (intr.)'	*nkw-lakwí*	*nklyakwí*	*^{0}nklyakì*	*^{0}klyakwì*
f.	*-lalá*	'bark (dog)'	*nkw-lalá*	*nklyalá*	*^{0}nklyalà*	*^{0}klyalà*
g.	*-^{0}leʔe*	'lick, taste'	*nkw-^{0}leʔe*	*nklyeʔě*	*^{0}nklyeʔe*	*^{0}klyeʔe*

The B classes' POT prefixes are *ki-* in ZEN and ZAC, and this class is the only of the B classes in Tataltepec Chatino to have a corresponding segmental prefix.

Semantically, the Bl verbs are similar to the Bc verbs in that they are intransitive and often describe activities.

9.1.1.2.4 Class Bk The *k*-initial stems of Class Bk have *n-* or *n<w>-* COMPL prefixes and their PROG and HAB prefixes are *nty-* and *nt-*, respectively. Class Bk has either a *ty-* or a null ∅ prefix POT. (13) shows examples of verbs of Class Bk.

(13) Verbs of Class Bk

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-koòn*	'throw, shoot'	*n-koòn*	*nty-koōn*	*nt-^{0}koòn*	*∅-^{0}koòn*
b.	*-kwanà*	'steal'	*n-kwanà*	*nty-kwanā*	*nt-^{0}kwana*	*∅-^{0}kwana*
c.	*-koʔó*	'dye'	*n-koʔó*	*nty-koʔó*	*nt-^{0}koʔò*	*(ty-)^{0}koʔò*
d.	*-kuná?*	'get lost'	*n-kuná?*	*nty-kuná?*	*nt-^{0}kunà?*	*ty-^{0}kunà?*
e.	*-kaʔa*	'defend'	*nkwaʔa*	*nty-kaʔa*	*nt-kaʔa*	*ty-kaʔa*
f.	*-^{0}katzòn*	'warm (intr.)'	*^{0}nkwatzòn*	*nty-^{0}katzòn*	*nt-^{0}katzòn*	*ty-^{0}katzòn*

The COMPL prefix is *n-* for stems with a stem-initial *kw* or for stems whose initial *k* is followed by a back vowel *o* or *u*, as with *n-koòn* 'C-shoot' (a), *n-kwanà* 'C-steal' (b), *n-koʔó* 'C-dye' (c), and *n-kuná?* 'C-get_lost'(d). The labialization of the stem-initial velar

applies vacuously when the stem-initial velar is *kw*, and is prohibited by the restriction on [+ labial] CV sequences (§ 4.3.5). For stems beginning with *ka*, *ke*, or *ki*, the COMPL prefix causes the labialization of the stem-initial consonant as seen in *nkwaʔa* 'C.defend' (e) and *^{0}nkwatzòn* 'C.warm' (f). Note that the resulting clusters contain singleton stops (/n-kõː^{L}/ → [^{ŋ}gõː]) rather than geminate stops (*/nk^{w}-kõː^{L}/ → [^{ŋ}kõː]), showing that the like stops have coalesced into one.

The POT prefix is somewhat variable, with some stems appearing routinely without a prefix like ∅-*^{0}koòn* 'P-shoot' (a) and ∅-*^{0}kwana* 'P-steal' (b), others like *ty-^{0}kunàʔ* 'P-get_lost' (d), *ty-kaʔa* 'P-defend'(e) and *ty-^{0}katzòn* 'P-WARM' (f) appear with a *ty-* prefix, and speakers disagree as to whether or not other stems such as *-koʔó* 'dye' (c) appear with the *ty-* or without it.[5]

It is difficult to generalize over the semantics of the relatively few verbs of Class Bk since both intransitive and transitive verbs are included. However, the transitive Class Bk verbs are found in the transitive ZEN Class Au and the intransitive Class Bk verbs are found in intransitive ZEN Class Bc. This suggests that Class Bk, which is found in TAT and ZAC, has two sources: Class Au and Bc, and that it is a Coastal Chatino innovation that ZEN did not participate in.

9.1.1.2.5 Class By The B class with the most members is Class By, so called because of the palatalized stops present in all forms of its verbs. This subclass is notable for having the same *nty-* prefix for the COMPL, PROG, and the HAB aspects, and the prefix *ty-*

[5]Though not found in my own investigations, K. Pride and Pride (1970) offers <cuna′> (presumeably /kunaʔ/) for 'P-get_lost', which in my corpus is always *ty-^{0}kunàʔ* 'P-get_lost'.

for the POT aspect, with the only segmental distinction being between the non-potential aspects beginning with a nasal, and the potential aspect which lacks it. (14) shows some examples of verbs of Class By.

(14) Verbs of Class By

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-akán?*	'get tied up'	*nty-akán?*	*nty-akán?*	*nty-^{0}akàn?*	*ty-^{0}akàn?*
b.	*-akìn*	'burn (intr.)'	*nty-akìn*	*nty-akìn*	*nty-^{0}akin*	*ty-^{0}akin*
c.	*-akón?*	'cover up'	*nty-akón?*	*nty-akón?*	*nty-^{0}akòn?*	*ty-^{0}akòn?*
d.	*-^{0}aten?*	'get untied'	*nty-^{0}aten?*	*nty-^{0}aten?*	*nty-^{0}aten?*	*ty-^{0}aten?*
e.	*-wií*	'clean, wipe (intr.)'	*nty-wií*	*nty-wií*	*nty-^{0}wiì*	*ty-^{0}wiì*
f.	*-^{0}wiì?*	'extinguish (intr.)'	*nty-^{0}wiì?*	*nty-wiî?*	*nty-^{0}wiì?*	*ty-^{0}wiì?*
g.	*-kutí*	'get soft, faint'	*nty-kutí*	*nty-kutí*	*nty-^{0}kutì*	*ty-^{0}kutì*
h.	*-kwé?*	'suffer'	*nty-kwé?*	*nty-kwé?*	*nty-^{0}kwè?*	*ty-^{0}kwè?*
i.	*-kwi?*	'speak'	*nty-kwi?*	*nty-kwī?*	*nty-kwi?*	*ty-kwi?*

The prefixes contain the stops (/nt^{j}-V/, /t^{j}-V/) rather than the stems (/n-t^{j}V/, /∅-t^{j}V/), and this can be shown in the derivation of more transitive verbs from these roots. The intransitive *nty-akán?* (C-tie_up) has *nkw-s-kán?* (C-CAUS-tie_up) as its more transitive counterpart derived by the *s-* transitivizing prefix. Were the *ty* part of the stem of 'tie up' (**n-tyakán?*), then the derivation of the transitive would require the stem-initial *ty* to mutate to *s*, or would imply that *ty-* is itself a derivational prefix used to derive intransitive verbs from roots. *y-* is identified as a derivational prefix in Zenzontepec Chatino, as in *nte-y-āką?* (G-INTR-tie_up). The use of *y-* as an intransitivizer does not appear to be synchronically identifiable in Tataltepec Chatino, as the *y- has fused with the aspect prefix in all cases.

Most of these represent vowel-initial stems like *-akán?* 'get tied up' (a), *-akìn* 'get burned, burn' (b), *-akón?* 'cover up' (c), and *-^{0}aten?* 'get untied, come loose' (d), though

consonant-initial stems (which have had their historical stem-initial vowels eliminated by syncope) are also present as with *-wií* 'get cleaned, wiped' (e), *-^{0}wiì?* 'go out, get extinguished' (f), *-kutí* 'soften, faint' (g), *-kwé?* 'suffer' (h) and *-kwi?* 'speak' (e-i). Class By verbs are often the counterparts of Class Bt or As verbs with*t-* or *s-* prefixes.

9.1.1.3 The C classes

The C classes are distinguished by having a *k-* POT prefix and (mostly) vowel-initial roots. Their prefixes are listed in (15).

(15) Class C prefixes

Class	Completive	Progressive	Habitual	Potential
C1	*nkw-*	*nty-*	*nty-*	*k-*
C2	*nty-*	*nty-*	*nt-*	*k-*

9.1.1.3.1 Class C1 Class C1 has a *nkw-* COMPL prefix, and a *k-* POT prefix. All Class C1 verbs have roots beginning with *a*. (16) shows some examples of verbs of Class C1.

(16) Verbs of Class C1

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-akà*	'be, become'	*nkkwà*	*nty-akâ*	*nty-^{0}ka*	*k-^{0}aka*
b.	*-alà*	'arrive'	*nkw-là*	*nklyā*	*nklya*	*k-ala*
c.	*-alú*	'grow'	*nkw-lú*	*nty-alû*	*^{0}nklyu*	*k-^{0}alu*
d.	*-asòn*	'wear out'	*nkw-sòn*	*nty-asōn*	*^{0}nxon*	*k-^{0}ason*
e.	*-atzá*	'snap in two'	*nkw-tzá*	*nty-atzā*	*nchá*	*k-atzá*
f.	*-atzà?*	'get wet'	*nkw-tzà?*	*nty-atzā?*	*nchá?*	*k-atzá?*
g.	*-atzú?*	'rot'	*nkw-tzú?*	*nty-atzû?*	*^{0}nchu?*	*k-^{0}atzu?*

The PROG and HAB prefixes are both *nty-*, though when the a penultimate stem vowel is syncopated and brings the *ty* into contact with another consonant, sometimes consonant

mutations occur, as in *nklyā* 'G.arrive' (b), *⁰nklyu* 'H.grow' (c), *⁰nxon* 'H.wear_out' (d), and *nchá* 'H.snap_in_two' (e). The syncopation of penultimate *a* (the most common penultimate vowel in TAT) in these verb stems appears most frequently in HAB stems, and less often in PROG stems, where it can be sporadically observed. It is unclear why penult *a* syncopation would be more common in verbs inflected for one aspect over another.

Class C1 verbs are intransitive and many describe changes in state, which are either gradual ('rot' (g)) or punctual ('snap in two' (e)).

9.1.1.3.2 Class C2 Examples of the verbs of Class C2 are given in (17). This class shares its *k-* POT and *nty-* PROG prefixes with Class C1, but differs in its *nt-* HAB prefix and its *nty-* COMPL prefix.

(17) Verbs of Class C2

	Stem	Gloss	COMPL	PROG	HAB	POT
a.	*-aku*	'eat'	*nty-aku*	*nty-akū*	*nt-aku*	*k-aku*
b.	*-ata*	'bathe'	*nty-ata*	*nty-atā*	*nttya*	*k-ata*
c.	*-akwèn*	'vomit'	*nty-akwèn*	*nty-akwên*	*nty-⁰kwen*	*k-⁰akwen*
d.	*-alaʔ*	'hold'	*nty-alaʔ*	*nty-alāʔ*	*nklyaʔ*	*k-alaʔ*
e.	*-ulá*	'dance'	*nty-ulá*	*nty-ulá*	*nt-⁰ulà*	*⁰kwlà*
f.	*-utzèn*	'be afraid'	*nty-tzèn*	*nty-utzēn*	*⁰ntzen*	*⁰kwtzen*
g.	*-jwì*	'kill'	*nty-jwì*	*nty-jwī*	*nt-⁰jwi*	*k-⁰jwi*
h.	*-jwìʔ*	'sell'	*nty-jwìʔ*	*nty-jwīʔ*	*nt-⁰jwiʔ*	*k-⁰jwiʔ*

Class C2 contains many verbs with roots beginning with *a* like Class C1 (*-aku* 'eat' (a), *-ata* 'bathe' (b), *-akwèn* 'vomit' (c), and *-alaʔ* 'hold' (d)), but also contains roots beginning with other vowels, like *-ulá* 'dance' (e) and *-utzèn* 'fear, be afraid' (f). Some historically vowel-initial stems which have lost their penult vowels, such as *-jwì* 'kill' (g) and *-jwìʔ* 'sell' (h) are also found in this class. In some instances, the *k-* prefix has fused with a

stem-initial *u* to form verbs beginning with *kw*, as seen in *^{0}kwlà* 'P.dance' (e) and *^{0}kwtzen* 'P.fear' (f).

9.1.1.4 Historical overview of the development of Chatino prefix classes

The verb classifications of Tataltepec Chatino, Zenzontepec Chatino, and Zacatepec Eastern Chatino are most similar when vowel-initial stems are present given the propensity of prefix vowels to syncopate, resulting in consonant clusters which may be simplified differently across the languages. Thus, Class C is the most familiar across Chatino. The only notable difference is that ZAC and ZEN show some allomorphy regarding the COMPL of Class C2, which can either be *y*- or the doubly-marked *nka-y*- (where the first element is identical to the COMPL of Classes Au and Ac). Only *nty*-, which is the reflex of the doubly-marked form (*nka-y- > *nky- > *nty*-), is found in on TAT's Class C2 COMPL. The membership of Classes C1 and C2 across the three languages is also fairly stable.[6]

Many of the differences in the B classes between the languages are due to morpho-phonological interactions of the consonant-initial stems and the aspect prefixes. Class By is clearly present in all three languages, and the only differences are the degree of fusion between the aspect prefixes and the (historical) *y*- intransitivizer: it is entirely fused to the aspect prefixes in TAT, where the prefixes themselves have been reduced from their pCH forms (POT *k-y- > *ty*-, HAB and COMPL *nk-y- > *nty*-, and PROG *nte-k-y- > *nty*-) whereas these are somewhat fused in ZEN where POT and HAB prefixes have fused with

[6]Curiously, K. Pride and Pride (1970) give <ngula> (either /nkula/ or /nk^{w}la/) for '*bailó*', which would suggest that *-ulá* 'dance' is a C1 (*nk-ulá*) verb rather than a C2 verb (*nty-ulá*), as is found in my own investigations. This would also make *-ulá* 'dance' the only C1 verb whose stem did not historically begin with *a. It is unclear if this is an error, an example of spurious morphological change (akin to English speakers' inflecting a weak verb (*dived*) as a strong verb *dove*) or a genuine form of 'dance'.

the *y*- intransitivizer, and the aspect prefixes remain entirely segmentable from the intransitivizer and the verb root in ZAC. There is no distinction in ZAC or TAT between ZEN's Classes Bt and Bc since none of the Proto-Chatino *ki- POT prefixes have survived for these verbs in ZAC and TAT. Instead of Class Bc calving off Class Bt, the reduction of the *ki- POT prefix in TAT and ZAC created Class Bk. The Bk COMPL in both ZAC and TAT was then reduced by haplology (*nku-kunaʔ > *n-kunaʔ). TAT's Class Bl is in some sense a relic of an earlier Bc since this is the only B subclass to preserve the *k* of the *ki- POT prefix.

While ZEN and ZAC both maintain Classes Au and Ac (albeit with different Ac POT prefixes), TAT innovated Class As, which is prefixless in the POT, and many erstwhile Au and Ac stems, as well as the newly-formed stems derived with *x*- causatives migrated to Class As, a change which is in progress and has advanced in the preceding forty years.[7] Similar to Tataltepec Chatino's Class As is Zacatepec Eastern Chatino's Class Aj, in which /h/-initial stems which once belonged to Au or Ac have lost their POT prefixes but otherwise take aspect prefixes similar to Au or Ac verbs. It is unclear if Tataltepec Chatino's As and Zacatepec Eastern Chatino's Aj developed independently or if their common ancestor innovated ∅- POT for some or all /h/-initial stems, creating a class to which Tataltepec Chatino then added other fricative-initial verb stems.

[7]K. Pride and Pride (1970) give <xatı̲′> for '*lo va a desatar*', <xa′be> for '*lo va a dividir*', <xñı̲> for '*lo va a agarrar*', and <xu′ba> for '*lo va a agregar*' indicating that *-s-^{0}ateneʔ* 'untie it', *-s-^{0}aʔwe* 'split it', *-snyii* 'grab it', and *-s-^{0}uʔwà* 'add it' then belonged to a ZAC-like Class Ac but today belong to TAT Class As.

9.1.2 Tonal paradigms

Aspect prefixes are but one part of aspect inflection in Tataltepec Chatino. Equally important (and perhaps historically more stable) is the tonal inflection in which a verb stem's base tone sequence is swapped with another tone sequence according to a tonal inflection paradigm. Tone sequence is a major exponent of aspect in Tataltepec Chatino, and in many cases is the only exponent of aspect, unlike Zenzontepec Chatino where tone sequence is never the only marker of a verb's aspect. As is true with all attested Chatino languages, the POT and HAB aspects have the same lexical tone sequence, save for a very few examples, which may prove to be suppletive or the result of improper elicitation or transcription.

A verb's tonal aspect inflection paradigm can be predicted with reasonable accuracy depending on the tone sequence of the COMPL verb (and given the tone sequence mergers that occurred in Pre-Tataltepec Chatino, knowing the tone sequence of the cognate verb in another Chatino can improve the accuracy considerably). For each of the tone sequences which appear on COMPL verbs (which will henceforth be referred to as "stem tone sequence sequences"), there exists at least one Major Paradigm (which is populated by a significant portion of the stems of the stem tone sequence) and at least one Minor Paradigm (which is scantly populated).

The complete list of paradigms is given in Table 9.2. A verb's stem tone sequence (T_{STEM}) is the same as its Completive tone (T_C) and is represented as T_{STEM+C}. The Progressive tone sequence (T_G) is either distinct from T_{STEM+C} or is the same, and the Habitual tone sequence (T_H) and the Potential tone sequence (T_P) are always the same and are represented as T_{H+P}.

T_{STEM+C}	T_G	T_{H+P}	$\%T_{STEM}$	T_{STEM+C}	T_G	T_{H+P}	$\%T_{STEM}$
L	H͡L	0-X	32.4% (24/74)	H	H	0-L	88% (88/100)
L	0L	0-X	18.9% (14/74)	H	H	H	12% (12/100)
L	L	L	12.2% (9/74)	H	0L	0-L	5% (5/100)
L	H͡L	X	6.8% (5/74)	H	0L	0-X	5% (5/100)
L	H͡L	H	5.4% (4/74)	H	H͡L	H	4% (4/100)
L	H͡L	0-L	5.4% (4/74)	H	H	0-X	2% (2/100)
L	L	0-L	4.1% (3/74)	H	H	L	1% (1/100)
L	L	0-X	4.1% (3/74)	H	H͡L	0-X	1% (1/100)
L	0L	0-L	2.7% (2/74)	X	H͡L	X	58.5% (24/41)
L	0L	L	1.4% (1/74)	X	X	X	36.6% (15/41)
L	0L	X	1.4% (1/74)	X	0	X	2.4% (1/41)
L	L	X	1.4% (1/74)	X	H͡L	0-X	2.4% (1/41)
L	0	X	1.4% (1/74)	0-L	0L	0-L	78.3% (18/23)
L	0-L	0-L	1.4% (1/74)	0-L	0-L	0-L	8.7% (2/23)
L	H	0-X	1.4% (1/74)	0-L	0L	0-X	4.3% (1/23)
0-X	0	0-X	71.4% (25/35)	0-L	H͡L	0-X	4.3% (1/23)
0-X	0-X	0-X	25.7% (9/35)	0-L	H	0-L	4.3% (1/23)
0-X	H͡L	0-X	2.9% (1/35)				

Table 9.2: Major and Minor Paradigms for tonal aspect inflection

As can be seen in Figure 9.1.2, each T_{STEM} has two major paradigms, either an invariant across-the-board paradigm where all principal parts of a verb will have the same tone sequence (T_C=T_G=T_H=T_P) and are only distinguished segmentally if at all, or a pattern involving some alternation in tone. This alternation might result in a different tone sequence for the POT and HAB stems ($T_{C+G} \neq T_{H+P}$) or more frequently there is a distinct tone sequence for the PROG compared to the COMP (= stem) tone sequence, which in turn may either be the same ($T_{C+H+P} \neq T_G$) or distinct ($T_C \neq T_G \neq T_{H+P}$) from the tone sequence of the HAB and POT. Such paradigmatic alternations, with POT and HAB sharing a tone which is distinct from the COMP and often the PROG is common in Eastern Chatino

topolects, and is a robust feature of Coastal Chatino.

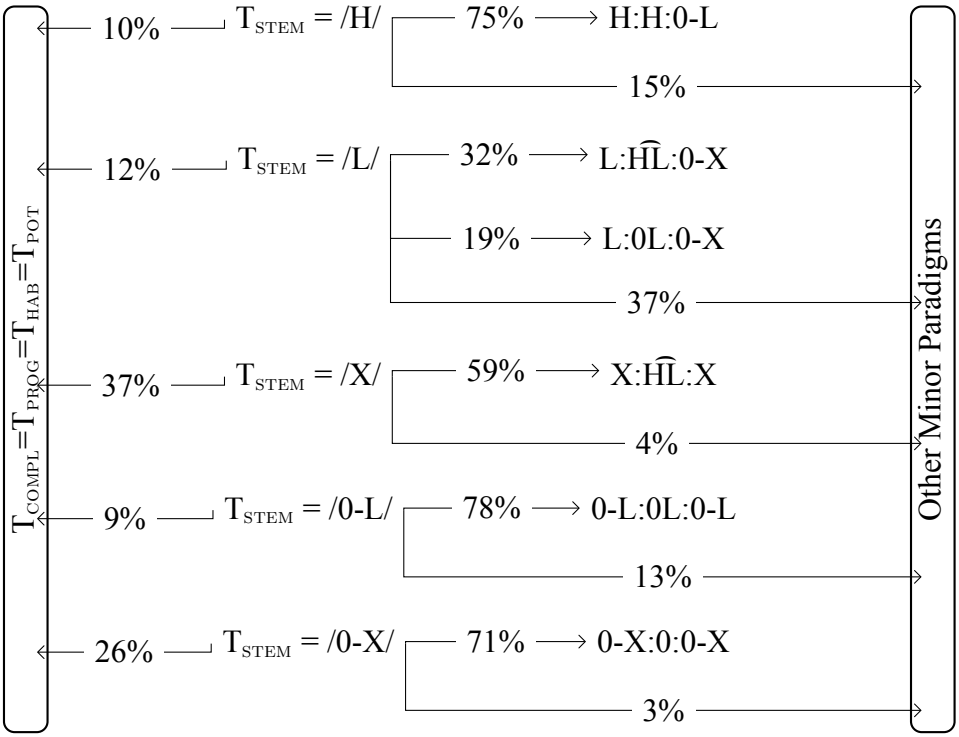

Figure 9.2: Most verb stems choose between a small number of tone paradigms

While the large number of tonal paradigms may seem unwieldly, it bears mentioning that a stem's choices for tone paradigm is greatly constrained by phonology, specifically the tone sequence of the aspect-uninflected stem. For example, a toneless /X/-toned stem will exhibit either the Major Paradigm associated with that tone sequence (/X:H͡L:X/) or the invariant across-the-board pattern /X:X:X/, in the vast majority of cases. Figure 9.2 shows that a verb stem of a given tone is overwhelmingly likely to belong to either one Major Paradigm (two in the case of /L/) or the invariant tone paradigm available to all stem tone sequences. Only stems of tone sequence /L/ have a relatively high proportion

of stems which are inflected through minor paradigms. Stems of tone sequence /X/ and /0-X/ are also more likely than stems of other tones to follow the invariant tone paradigm. Once verb stems belonging to major and invariant paradigms are excluded, only 48 verb stems in my corpus follow a minor pattern, several of which are only attested on a single verb.

The tone inflection paradigms are robust and appear to be quite stable diachronically. Despite Tataltepec Chatino's merger of two pairs of tone sequences which are distinct in most Eastern Chatino topolects (18) the Major Paradigms which are cognate to Tataltepec's can be recovered.

(18) Four ECH tone sequences correspond to two TAT tone sequences

Tataltepec Chatino		Gloss	Quiahije Chatino	
xnèʔ	L	'dog'	*xneʔ*^{M}	M
keè	L	'flower'	*ke*^{M}	M
kwiʔyù	L	'flea'	*ʔyu*^{M}	M
kwjèn	L	'net bag'	*jen*^{LM}	LM
kooˋ	L	'cloud'	*ko*^{LM}	LM
kwanyà	L	'crocodile'	*kna*^{LM}	LM
kwanyà	H	'snake'	*kna*^{H}	H
yaná	H	'resin incense'	*yna*^{H}	H
xtyaʔán	H	'mother'	*yʔan*^{H}	H
xeé	H	'light'	*xa*^{MH}	MH
katyá	H	'edible greens'	*kta*^{MH}	MH
kwlixí	H	'butterfly'	*si*^{MH}	MH

(19) shows that /L/ stems which are cognate to set C stems in ECH prefer one Major Paradigm whereas stems cognate to set G stems prefer another Major Paradigm.[8]

[8]Beginning with H. Cruz and Woodbury (2006), Eastern Chatino's etymological sets have been identified by capital letters. These etymological sets are stable across Eastern Chatino, though some of the origi-

(19) ECH cognate stem tone sequence predicts paradigm choice among TAT /L/ stems

Paradigm			%T_{STEM}	
T_C	T_G	T_{H+P}	ECH Set C	ECH Set G
L	H͡L	0-X	25% (4/16)	72.7% (16/22)
L	0L	0-X	37.5% (6/16)	9.1% (2/22)
L	H͡L	H		13.6% (3/22)
L	H͡L	X	12.5% (2/16)	
L	0L	0-L	6.3% (1/16)	
L	L	0-L	6.3% (1/16)	
L	L	X	6.3% (1/16)	
L	L	0-X	6.3% (1/16)	
L	H	0-X		4.5% (1/22)

Curiously, the other major tone sequence merger evident in Tataltepec Chatino (Tataltepec Chatino's /H/ corresponds to Eastern Chatino sets E and F) appears to be complete in that only one Major Paradigm is preferred by the numerous /H/ stems (20).

(20) ECH cognate stem tone sequence does not predict paradigm choice among TAT /H/ stems

Paradigm			%T_{STEM}	
T_{+C}	T_G	T_{H+P}	ECH Set E	ECH Set F
H	H	0-X	82.9% (34/41)	76% (19/25)
H	H͡L	H	7.3% (3/41)	4% (1/25)
H	H	H	7.3% (3/41)	4% (1/25)
H	0L	0-X	2.4% (1/41)	8% (2/25)
H	0L	0-L		8% (2/25)

A few pieces of information are necessary to know the tone inflection paradigm of a verb. The T_{STEM+C} may either be the same as the T_G or will be different, and the T_{STEM+C} may

nal etymological sets have split and merged in various topolects. The phonological form of each etymological tone set is particular to that topolect. For example, Sets C = /M/, G = /LM/, E = /H/, and F = /MH/ in Quiahije Eastern Chatino, but C = /M-H/, G = /MM/, E = /MH/ and F = /L͡H/ in Zacatepec Eastern Chatino.

either be the same as the T_{H+P}. While many of the $T_C \rightarrow T_G$ alteration can be synchronically be explained only be a tone sequence replacement, the Major Paradigms where T_{STEM} contains an unlinked superhigh tone inflect for T_G by linking the unlinked tone (i.e. /0-X/→/0/ and /0-L/→/0L/). The relationships between distinct T_{STEM+C} and T_{H+P} are more difficult to identify (e.g. /L/→/0-X/ and /H/→/0-L/) and synchronically habitual and potential aspect inflection involve wholesale replacement of the tone sequence of the stem. It is notable that the Major Paradigms where $T_{STEM+C} \neq T_{H+P}$ all involve the substitution of the stem tone sequence with a tone sequence containing an unlinked tone.

9.1.2.1 Paradigm H:H:0-L

The largest tone aspect paradigm is H:H:0-L, where T_{C+G} is /H/ and T_{H+P} is /0-L/. A very large number of verbs in my corpus (88) follow this paradigm, and only a few are exemplified in (21). A sizeable number of these verbs like *-s-atá* 'open it' (a), *-s-kwén* 'shake it' (b) and *-x-akú* 'feed' (c) are of prefix Class As, which is not surprising since Class As contains many derived causative verbs, and the addition of the *x-* causative prefix is often accompanied by a replacement of the verb root's T_{STEM} with /H/, as was the case with *-x-akú* 'feed it' (c), which was derived from the $\sqrt{}$*aku* 'eat' which has /X/ as its T_{STEM}. Recall that in my A:B:C notation, A indicates the tone sequence of the stem and the completive aspect, B the tone sequence of the progressive aspect, and C the tone sequence of the habitual and potential aspects.

(21) Some verbs of Paradigm H:H:0L

	Stem	Class	Gloss	COMPL	PROG	HAB	POT
a.	*-s-atá*	As	'open it'	*nkw-s-atá*	*nx-atá*	*n-s-^{0}atà*	*∅-s-^{0}atà*
b.	*-s-kwén*	As	'shake it'	*nkw-s-kwén*	*nx-kwén*	*n-s-^{0}kwèn*	*∅-s-^{0}kwèn*
c.	*-x-akú*	As	'feed it'	*nkw-x-akú*	*n-x-akú*	*n-x-^{0}akù*	*∅-x-^{0}akù*
d.	*-kwéʔ*	By	'suffer'	*nty-kwéʔ*	*nty-kwéʔ*	*nty-^{0}kwèʔ*	*ty-^{0}kwèʔ*
e.	*-uná*	C2	'cry'	*nty-uná*	*nty-uná*	*nt-^{0}unà*	*k-^{0}unà*
f.	*-alá*	C1	'water'	*nkw-alá*	*nty-alá*	*nty-^{0}alà*	*ty-^{0}alà*

This pattern is similar to paradigm patterns found in Zenzontepec Chatino, where the T_C=T_G just as T_H=T_P. In many of the tone paradigms in Tataltepec Chatino and Eastern Chatino $T_C \neq T_G$, as with the following paradigm X:H͡L:X.

9.1.2.2 Paradigm X:H͡L:X

Another common pattern in tone paradigms in Tataltepec Chatino are situations in which $T_C \neq T_G$, as with tone paradigm /X:H͡L:X/. As will be discussed in § 9.1.2.9, this is the result of a historically active tone on the PROG prefix. (22) lists some examples of verbs of the X:H͡L:X paradigm, where T_G deviates from what would otherwise be an invariant tone paradigm.

(22) Some verbs of Paradigm X:H͡L:X

	Stem	Class	Gloss	COMPL	PROG	HAB	POT
a.	*-jatya*	As	'wait for it'	*nkw-jatya*	*nty-jatyā*	*nt-jatya*	*∅-jatya*
b.	*-taʔan*	Bc	'walk'	*nkw-taʔan*	*ntyaʔān*	*ntyaʔan*	*tyaʔan*
c.	*-tzaʔan*	Bc	'fill up'	*nkw-tzaʔan*	*nchaʔān*	*nchaʔan*	*chaʔan*
d.	*-kwiʔ*	By	'speak'	*nty-kwiʔ*	*nty-kwīʔ*	*nty-kwiʔ*	*ty-kwiʔ*
e.	*-aku*	C2	'eat'	*nty-aku*	*nty-akū*	*nt-aku*	*k-aku*
f.	*-ata*	C2	'bathe'	*nty-ata*	*nty-atā*	*nttya*	*k-ata*

For many verb classes, and those sporadic instances where the distinction between PROG and HAB is being lost among prefixes, this distinction between is maintained only

by the difference in tone sequence between the two. For Class By verbs (with prefixes COMPL *nty-*, PROG *nty-*, HAB *nty-*, and POT *ty-*), the Completive and Habitual forms of these stems are identical.

Other paradigms combine the two patterns already seen ($T_{STEM+C} \neq T_{H+P}$ and $T_{STEM+C} \neq T_G$), as with the following paradigm L:H͡L:0-X.

9.1.2.3 Paradigm L:H͡L:0-X

Tone paradigm L:H͡L:0-X is in many regards typical of Coastal Chatino verb aspect tone paradigms: three different stem tone sequence sequences are required to identify the paradigm: $T_{STEM+C} \neq T_G \neq T_{H+P}$. While $T_C \neq T_G$, there is a historical connection between the two, with T_G being a transformation of T_C.

For those verb classes and individual stems where the distinction between PROG and HAB has been lost among prefixes, this distinction is maintained only by the difference in tone sequence between the two. (23) shows some examples of verb stems inflected through this paradigm.

(23) Some verbs of Paradigm L:H͡L:0-X

	Stem	Class	Gloss	COMPL	PROG	HAB	POT
a.	*-atzù*	'burst it'	C1	*nkwchù*	*nty-atzū*	*^{0}nchu*	*^{0}kwchu*
b.	*-teèn*	'carry it'	Au	*nkw-teèn*	*ntyeēn*	*n-^{0}teen*	*kw-^{0}teen*
c.	*-tuù?*	'cough'	Bc	*nkw-tuù?*	*ntyuū?*	*^{0}ntyuu?*	*^{0}tyuu?*
d.	*-kwanà*	'steal'	Bk	*nkwanà*	*nty-kwanā*	*nt-^{0}kwana*	*∅-^{0}kwana*
e.	*-o?ò*	'drink'	C2	*nty-o?ò*	*nty-o?ō*	*nty-^{0}i?yu*	*k-^{0}o?o*
f.	*-unà*	'hear, listen'	C2	*nty-unà*	*nt-unā*	*nt-^{0}una*	*k-^{0}una*

As will be discussed in § 9.1.2.9, the stems of this paradigm are cognate to verb stems in Eastern Chatino topolects of a particular tone sequence which has merged with another

to form the /L/ tone sequence of TAT. A large number of stems of prefix Class C2, such as *-oʔò* 'drink' (e) and *-unà* 'hear' (f) are inflected tonally though this paradigm.

9.1.2.4 Paradigm L:0L:0-X

Tone paradigm /L:0L:0-X/ is another tone paradigm with a direct cognate in Eastern Chatino, where $T_C \neq T_G \neq T_{H+P}$. (24) shows some examples of verb stems inflected through this paradigm.

(24) Some verbs of Paradigm L:0L:0-X

	Stem	Class	Gloss	COMPL	PROG	HAB	POT
a.	*-oʔnì*	Au	'do'	*nkw-aʔnì*	*nty-oʔnî*	*nt-^{0}oʔni*	*kw-^{0}aʔni*
b.	*-x-alàʔ*	As	'cool it'	*nkw-x-alàʔ*	*n-x-alâʔ*	*n-x-^{0}alaʔ*	*∅-x-^{0}alaʔ*
c.	*-akà*	C1	'be'	*nkkwà*	*nty-akâ*	*nty-^{0}ka*	*k-^{0}aka*
d.	*-akwèn*	C2	'vomit'	*nty-akwèn*	*nty-akwên*	*nty-^{0}kwen*	*k-^{0}akwen*
e.	*-jòn*	Au	'spin thread'	*nk-jòn*	*nty-jôn*	*nt-^{0}jon*	*k-^{0}jon*
f.	*-asùʔ*	C1	'grow old'	*nkw-sùʔ*	*nty-asûʔ*	*^{0}nxuʔ*	*k-^{0}asuʔ*

For those verb classes and individual stems where the distinction between PROG and HAB has been lost among prefixes, the distinction is maintained only by the difference in tone sequence between the two. As will be discussed in § 9.1.2.9, the stems of this paradigm are cognate to verb stems in Eastern Chatino topolects of a particular tone sequence which has merged with another to form the /L/ tone sequence of TAT.

9.1.2.5 Paradigm 0-L:0L:0-L

Similar to paradigm X:H͡L:X where $T_{C+H+P} \neq T_G$ is paradigm 0-L:0L:0-L where T_{C+H+P} is /0-L/ and T_G is /0L/, as seen in (25).

(25) Some verbs of Paradigm 0-L:0L:0-L

	Stem	Class	Gloss	COMPL	PROG	HAB	POT
a.	*-^{0}alà*	By	'be opened'	*nty-^{0}alà*	*nty-alâ*	*nty-^{0}alà*	*ty-^{0}alà*
b.	*-^{0}katzòn*	Bk	'warm'	*^{0}nkwatzòn*	*nty-atzôn*	*nty-^{0}atzòn*	*ty-^{0}atzòn*
c.	*-^{0}lakwà*	Bl	'be counted'	*nkw-^{0}lakwà*	*nklyakwâ*	*nk-^{0}lakwà*	*^{0}klyakwà*
d.	*-^{0}staà*	As	'place it'	*nkw-^{0}staà*	*nxtyaâ*	*n-^{0}staà*	*∅-^{0}staà*
e.	*-x-^{0}kinyì*	As	'stretch it'	*nkw-x-^{0}kinyì*	*n-x-kinyî*	*n-x-^{0}kinyì*	*∅-x-^{0}kinyì*
f.	*-^{0}wiì?*	By	'go out'	*nty-^{0}wiì?*	*nty-wiî?*	*nty-^{0}wiì?*	*ty-^{0}wiì?*

As will be discussed in § 9.1.2.9 below, this was most likely an invariant /0-L/ paradigm historically, in which a phonologically active tone was present on the PROG prefix and caused the linking of the unlinked tone in the historic /0-L/ tone sequence. Synchronically, the $T_C \rightarrow T_G$ inflection is marked by the linking of the unlinked superhigh tone of the base tone sequence. For those verb classes and individual stems where the distinction between PROG and HAB has been lost among prefixes, the distinction is maintained only by the difference in tone sequence between the two.

9.1.2.6 Paradigm 0-X:0:0-X

Similar to the paradigms 0-L:0L:0-L and X:H$\widehat{\text{L}}$:X where $T_{C+H+P} \neq T_G$ is paradigm 0-X:0:0-X, where all aspects save the PROG carry tone sequence /0-X/ and the T_G is /0/, as seen in (26).

(26) Some verbs of Paradigm 0-X:0:0-X

	Stem	Class	Gloss	COMPL	PROG	HAB	POT
a.	*-^{0}jyakwan*	As	'sew it'	*nkw-^{0}jyakwan*	*nt-jyakwăn*	*nt-^{0}jyakwan*	*∅-^{0}jyakwan*
b.	*-s-^{0}aten?*	As	'untie it'	*nkw-s-^{0}aten?*	*nx-ateĕn?*	*n-s-^{0}aten?*	*∅-s-^{0}aten?*
c.	*-^{0}xen*	Bc	'roll it up'	*nkw-^{0}xen*	*nk-xĕn*	*nk-^{0}xen*	*k-^{0}xen*
d.	*-^{0}lya*	Bl	'be scraped'	*nkw-^{0}lya*	*nk-lyă*	*nk-^{0}lya*	*k-^{0}lya*
e.	*-x-^{0}kinya*	As	'move it'	*n-x-^{0}kinya*	*n-x-kinyă*	*n-x-^{0}kinya*	*∅-x-^{0}kinya*
f.	*-^{0}le?e*	Bl	'lick, taste'	*nkw-^{0}le?e*	*nklye?ĕ*	*^{0}nklye?e*	*^{0}klye?e*

As will be discussed in § 9.1.2.9 below, this was most likely an invariant /0-X/ paradigm historically, in which a phonologically active tone was present on the PROG prefix and caused the linking of the unlinked tone in historic /0-X/ tone sequence. Synchronically, the $T_C \rightarrow T_G$ inflection is marked by the linking of the unlinked superhigh tone of the base tone sequence. For those verb classes and individual stems where the distinction between PROG and HAB has been lost among prefixes, the distinction is maintained only by the difference in tone sequence between the two.

9.1.2.7 Invariant aspect paradigms

A sizable number of verb stems in Tataltepec Chatino have the same tone sequence no matter which aspect they are inflected in (T_C=T_G=T_{H+P}). In some sense then, these verbs with invariant or across-the-board paradigms are then not inflected tonally for aspect at all. Given the absence of tonal distinctions between aspects, stems following these paradigms are apt to not distinguish between aspects where these are not distinguished segmentally, as with many cases of PROG and HAB being identical (especially in the numerous Class As stems with palatalized or unpalatalizable stem-initial consonants), we well as the entire sizeable Class By where the only formal distinction between aspects is between the potential (*ty-*) and the completive, habitual, and progressive aspects as a

whole (effectively, the non-potential), all of which have the same *nty-* prefix. (27) shows some examples of verb stems inflected with an invariant tone paradigm.

(27) Some verbs of with across-the-board Paradigms

	Stem	Class	Gloss	COMPL	PROG	HAB	POT
a.	*-soón*	Au	'fight'	*nkw-soón*	*nxoón*	*n-soón*	*kw-soón*
b.	*-anó*	By	'remain'	*nty-anó*	*nty-anó*	*nty-anó*	*ty-anó*
c.	*-aʔà*	By	'complete'	*nty-aʔà*	*nty-aʔà*	*nty-aʔà*	*ty-aʔà*
d.	*-xonà*	As	'begin'	*nkw-xonà*	*n-xonà*	*n-xonà*	*∅-xonà*
e.	*-sti*	Bc	'lie on ground'	*nkw-sti*	*nxtyi*	*nxtyi*	*xtyi*
f.	*-ati*	By	'polish'	*nty-ati*	*nty-ati*	*nty-ati*	*ty-ati*
g.	*-^{0}aten?*	By	'get untied'	*nty-^{0}aten?*	*nty-^{0}aten?*	*nty-^{0}aten?*	*ty-^{0}aten?*
h.	*-s-^{0}we?*	As	'scrape it'	*nk-s-^{0}aʔwe*	*nx-^{0}aʔwe*	*n-s-^{0}aʔwe*	*∅-s-^{0}aʔwe*

Note that for some verbs such as *-anó* 'stay' (b), *-aʔà* 'complete' (c), *-ati* 'polish' (f), and *-^{0}aten?* 'loosen, get untied' (g), the lack of tonal aspect distinctions together with the homophony of their COMPL, PROG, and HAB aspect prefixes results in the aspectual differences of these verbs being effectively leveled into a potential versus non-potential distinction.

9.1.2.8 Minor Paradigms

Some 46 stems in my verb corpus follow one of 18 minor tone inflection paradigms. Figure 9.3 shows each of these minor paradigms along with the number of stems following each pattern and an example of a verb stems following each paradigm. While a few of these are found on three to five stems and may be genuine minor paradigms, others are represented by only one verb stem and may have been recorded in error, either by errors in transcription and lexical tone diagnosis or problems in distinguishing different aspects of the same stem, or different-valence stems of the same verb root. Most of these minor

paradigms differ from a major paradigm in only one aspect's tone sequence. For example, paradigm L:L:0-X exemplifies by *-akìn* 'get burned' (c) would be the same as either major paradigm L:H͡L:0-X or L:0L:0-X were it not for the otherwise anomalous /L/ T_G. The verb *-ajàʔ* 'sleep' (o) may not belong (historically) to the minor paradigm L:0-L:L since the PROG is the lateral-initial *l-*^{0}*ajàʔ*, which may have been the stative aspect only found on a very small number of verbs, and is a case of suppletion (with the STAT *l-*^{0}*ajàʔ* replacing the original PROG *ʔ*nty-ajàʔ*) creating an irregular tonal paradigm out of a regular L:L:L paradigm.

One minor paradigm stem is unusual since it is the only example of a stem, *-oò* 'grind it', whose HAB form *nty-*^{0}*iyu* does not share its tone with the POT *k-oò* (r). This could be the result of the renalysis of its T_P as /0-L/ from an earlier /0-X/, which would mirror T_H and bring the verb stem into a Major Paradigm: L:0L:0-X.

	T_C	T_G	T_{H+P}	#			COMPL	PROG	HAB	POT	
a.	H	0L	0-L	5	*-uké?*	Au	'cook it'	*nk-uké?*	*nty-akê?*	*nt-^{0}kè?*	*k-^{0}ukè?*
b.	H	0L	0-X	5	*-alú*	C1	'grow'	*nkw-lú*	*nty-alû*	*nty-^{0}alu*	*k-^{0}alu*
c.	L	L	0-X	4	*-akìn*	By	'get burned'	*nty-akìn*	*nty-akìn*	*nty-^{0}akin*	*ty-^{0}akin*
d.	H	H͡L	H	4	*-atzá*	C1	'snap'	*nkw-tzá*	*nty-atzā*	*nchá*	*k-atzá*
e.	L	H͡L	H	4	*-atzà?*	A2	'get wet'	*nkw-tzà?*	*nty-atzā?*	*nchá?*	*k-atzá?*
f.	L	H͡L	X	4	*-akà*	By	'recuperate'	*nty-akà*	*nty-akā*	*nty-aka*	*ty-aka*
g.	L	H͡L	0-L	3	*-laà*	Au	'release it'	*nkw-laà*	*nklyaā*	*nk-^{0}laà*	*kw-^{0}laà*
h.	L	L	0-L	3	*-atà?*	C2	'chew it'	*nty-atà?*	*nty-atà?*	*nty-^{0}atà?*	*k-^{0}atà?*
i.	L	0L	0-L	3	*-a?nì*	irr.	'pummel'	*nkw-a?nì*	*nty-a?nî*	*nty-^{0}a?nì*	*ty-^{0}a?nì*
j.	L	L	X	2	*-jèn*	irr	'pass'	*nt-jèn*	*nty-jèn*	*nty-jen*	*ty-jen*
k.	H	H	0-X	2	*-xkwí*	As	'suck'	*n-xkwí*	*n-xkwí*	*n-^{0}xkwi*	*∅-^{0}xkwi*
l.	H	H	L	1	*-atzí?*	By	'shrivel up'	*nty-atzí?*	*nty-atzí?*	*nty-atzì?*	*ty-atzì?*
m.	L	0L	L	1	*-atèn*	By	'launder'	*nty-atèn*	*nty-atên*	*nty-atèn*	*ty-atèn*
n.	L	0	X	1	*-lijì*	Bl	'disappear'	*nkw-lijì*	*nklyijǐ*	*nklyiji*	*klyiji*
o.	L	0-L	L	1	*-ajà?*	C1 irr.	'sleep'	*nkw-jà?*	*l-^{0}ajà?*	*nty-jà?*	*k-jà?*
p.	0-L	H	0-L	1	*-^{0}kwàn*	By	'shiver'	*nty-^{0}kwàn*	*nty-kwán*	*nty-^{0}kwàn*	*ty-^{0}kwàn*
q.	0-L	0L	0-X	1	*-^{0}ajì*	C1	'be found'	*nkw-^{0}jì*	*nty-jî*	*nty-^{0}ji*	*k-^{0}ja*
r.	L	0L	0-X/0-L	1	*-oò*	C2 irr.	'grind it'	*nty-oò*	*nty-oô*	*nty-^{0}iyu*	*k-^{0}oò*

Figure 9.3: Some verbs of minor Paradigms

9.1.2.9 Comparison to other languages

Figure 9.4 reports the tone aspect paradigms which have been identified for Zacatepec Eastern Chatino by Villard (2015).[9] In cases where Villard has shown that T_G tone is clearly the result of a given tone sequence being preceded with a /M/-toned prefix, these are indicated by preceding the Tone Set symbol with a lowercase *m*, as in the paradigm E:mE:E, where an otherwise invariant paradigm has a distinct T_G due to the presence of a /M/-tone prefix preceding the stem's tone sequence, as in (28).

(28) Mid-tone progressive prefixes in Zacatepec Eastern Chatino

Completive		Progressive		Gloss
nka-t-akīn´	M-H	*ntā-t-akīn´*	M M-H	'burn it'
nka-sună	L͡H	*ntā-sună*	M L͡H	'run'
nkwi-chàʔǎn	LL͡S	*ntā-tsàʔǎn*	M LL͡S	'change clothes'
nk-y-ānān	MM	*ntī-k-yānān*	M MM	'wilt'
nka-sālá	MH	*ntā-sālá*	M MH	'open it'

Some parallels between Zacatepec Eastern Chatino and Tataltepec Chatino's aspect inflection paradigms can be made. Both have very common paradigms in which a high-toned stems have $T_{C+G} \neq T_{H+P}$, as well as paradigms where a low-toned stem has $T_C \neq T_G \neq T_{H+P}$ inflection, and a few paradigms of the form $T_{C+H+P} \neq T_G$.

Figure 9.5 lists the tone aspect paradigms of Zenzontepec Chatino in order of decreasing frequency in Campbell's (2013b, 7) corpus of simple verb stems. The total num-

[9] Villard's tone notation has been modified as follows: the tones LS (a rising low-to-superhigh tone) and LH are written L͡S and L͡H to avoid ambiguities, and the hyphen is used only to separate the linked and unlinked portions of a tone sequence's tone sequence. Contrary to Tataltepec Chatino, floating tones appear on the right side of a stem in Eastern Chatino (including Zacatepec), so a tone sequence like /M-H/ represents a linked Mid tone followed by an unlinked High tone. Villard also represents each etymological set with a numeral, whereas I am representing them with the letters common to other treatments of Eastern Chatino etymological sets.

T_C	T_G	T_{H+P}	ECH set	$\%T_C$
MH	MMH	L͡LS	E:mE:H	29.0% (63/217)
X	ML	X	A:I:A	13.4% (29/217)
MM	MML	L-L	G:I:B	7.4% (16/217)
L͡H	ML͡LH	L-L	F:mF:B	6.9% (15/217)
L͡H	MMH	L-L	F:mE:B	6.5% (14/217)
ML͡SL-L	ML͡SL-L	L-L	D:D:B	6.5% (14/217)
M-H	MLM-H	L-L	C:mC:B	5.5% (12/217)
L-L	ML͡SL-L	L-L	B:D:B	3.7% (8/217)
M-H	MLM-H	M-H	C:mC:C	3.2% (7/217)
MM	MML	X	G:I:A	2.8% (6/217)
MM	MMM	MM	G:mG:G	2.8% (6/217)
L͡LS	ML͡LS	L͡LS	H:mH:H	1.8% (4/217)
MM	MMM	L-L	G:D:B	1.8% (4/217)
MH	MMH	MH	E:mE:E	1.8% (4/217)
M-H	MMH	L-L	C:mE:B	1.4% (3/217)
L͡H	ML͡LH	L͡H	F:mF:F	1.4% (3/217)
ML͡SL-L	ML͡SL-L	ML͡SL-L	D:D:D	1.4% (3/217)
ML	ML	L-L	I:I:B	0.9% (2/217)
M-H	ML	L-L	C:I:B	0.5% (1/217)
L͡H	L-L	L-L	F:B:B	0.5% (1/217)
ML	ML	ML	I:I:I	0.5% (1/217)
X	ML	L͡LS	A:I:H	0.5% (1/217)

Figure 9.4: Tone aspect paradigms in Zacatepec Eastern Chatino

ber of tonal paradigms is rather small and fully 72% of the verbs follow invariant paradigms, and nearly a third of all of the verbs are phonologically toneless in all aspects, leading Campbell to suggest that "much analogical leveling has occurred" in Zenzontepec Chatino.

As mentioned above, most Zenzontepec Chatino paradigms (72%) are invariant, and most of the remainder (23% 82/363) are of the form $T_{C+G} \neq T_{H+P}$, with the remaining few being of the form $T_C \neq T_{G+H+P}$ (4% 14/363) and $T_{C+H+P} \neq T_G$ (2% 6/363). The former

T_C	T_G	T_{H+P}	Total	% of Total
∅∅	∅∅	∅∅	116	32.0%
MH	MH	MH	68	18.7%
∅M	∅M	∅M	47	12.9%
HM	HM	∅∅	39	10.7%
MH	MH	∅M	30	8.3%
H∅	H∅	H∅	27	7.4%
∅M	∅M	∅∅	7	1.9%
MH	∅M	∅M	7	1.9%
∅M	∅M	MH	6	1.7%
MH	∅M	MH	6	1.7%
HM	∅∅	∅∅	5	1.4%
HM	HM	HM	3	0.8%
∅M	∅∅	∅∅	2	0.6%
Total	363			

Figure 9.5: Tone aspect paradigms in ZEN

are cases where the PROG also includes the *k-* prefix of the POT, indicating that the PROG prefix was affixed to the POT-inflected stem rather than the verb root.

9.1.3 On the intersection of aspect prefix classes and aspect tone paradigms

Since the presence of ten aspect prefix classes and as many as thirty tonal aspect paradigms implies a staggering three hundred inflectional classes, it is worth exploring the possibility of simplifying the prefix and tone sequence intersection. As it stands, 104 of the possible prefix class:tone paradigm combinations are attested, and only 46 of these are attested for more than one simple verb stem. While the system of aspect prefixes and tonal paradigms are largely independent, the choice of tone paradigm is greatly constrained by the tone sequence of the verb stem. Even though stems of tone sequence /L/ have thirteen choices for their tone paradigm, most verb of most stem tone sequence sequences may

only choose between two or three tone paradigms.

Figure 9.6 summarizes the distribution of simplex verbs stems across the various prefix classes of Tataltepec Chatino. The greatest number of stems are found in tone sequences /H/ and /L/ (which is unsurprising given that each of these is formed from the merger of what are two distinct tone sequences in other Chatino languages, and replacement of a root tone with /H/ that can co-occur with the *x*- prefix), with a smaller number of /X/, /0-X/, and /0-L/ tone sequences present, and a very few (likely fossilized compounds) verb stems of tone sequences /H͡L/, /0L/, and /0/. There are few clear patterns that can be seen in this distribution, but a some observations can be made. It is interesting that while tone sequences /H/, /0-X/, and /0-L/ have similar distributions among the stems of the verb classes (with Classes A and B having similar shares of the bulk of each, with Class C having a smaller portion), verb stems of tone sequence /L/ are more likely to belong to Class C and those of tone sequence /X/ are more likely to belong to Class B. Class As is more likely to have the H:H:0-L paradigm owing to the replacement of a verb root's tone sequence with /H/ that often accompanies the *s*- or *x*- prefixes which are typical of Class As verbs. Further research will no doubt find other correlations between prefix class and aspect inflection paradigms.

E. Campbell (2013b) found that the two inflection schemes were largely independent, but Villard (2015) has found that prefix class (and in particular which allomorph of the completive prefix a class uses) can reduce the number of aspect inflection paradigms available to a stem in Zacatepec Eastern Chatino, though a full comparison of her findings with Tataltepec Chatino's paradigms is not available at this time.

T_C	T_G	T_{H+P}	As	By	Bc	C1	Au	Bt	C2	Bl	Bk	A2	#	%
H	H	0-L	24	13	10	-	11	9	4	4	2	-	77	29.7
X	H͡L	X	5	4	4	2	-	2	5	-	1	-	23	8.9
L	H͡L	0-X	5	1	2	4	2	1	6	-	1	1	23	8.9
0-X	0	0-X	7	3	1	2	4	2	-	3	-	-	22	8.5
0-L	0L	0-L	8	3	-	1	2	2	-	1	-	-	17	6.6
X	X	X	3	3	5	1	-	-	-	-	1	-	13	5.0
H	H	H	6	3	2	-	1	-	-	-	-	-	12	4.6
L	0L	0-X	3	1	-	2	-	-	2	-	-	-	8	3.1
0-X	0-X	0-X	3	3	-	-	1	-	-	-	1	-	8	3.1
H	0L	0-X	-	-	-	5	-	-	-	-	-	-	5	1.9
H	0L	0-L	-	-	-	1	1	1	1	-	-	-	5	1.9
L	L	L	1	1	-	1	-	2	-	-	-	-	5	1.9
H	H͡L	H	-	2	-	2	-	-	-	-	-	-	4	1.5
L	L	0-X	1	1	1	-	-	1	-	-	-	-	4	1.5
L	H͡L	H	-	-	-	4	-	-	-	-	-	-	4	1.5
H͡L	H͡L	H͡L	2	1	-	-	-	1	-	-	-	-	4	1.5
L	H͡L	0-L	-	-	-	-	1	-	-	1	-	1	3	1.2
L	0L	0-L	-	1	-	-	-	1	-	-	1	-	3	1.2
L	L	0-L	1	-	-	-	-	-	1	1	-	-	3	1.2
L	H͡L	X	1	1	-	-	-	-	1	-	-	-	3	1.2
H	H	0-X	1	-	-	-	-	-	1	-	-	-	2	0.8
L	L	X	1	-	1	-	-	-	-	-	-	-	2	0.8
0L	0L	0L	1	1	-	-	-	-	-	-	-	-	2	0.8
H	H	L	-	1	-	-	-	-	-	-	-	-	1	0.4
L	0L	L	-	1	-	-	-	-	-	-	-	-	1	0.4
L	0-L	L	-	-	-	1	-	-	-	-	-	-	1	0.4
L	0	X	-	-	-	-	-	-	-	1	-	-	1	0.4
0-L	0L	0-X	-	-	-	1	-	-	-	-	-	-	1	0.4
0-L	H	0-L	-	-	-	-	-	1	-	-	-	-	1	0.4
0	0	0	-	-	-	-	1	-	-	-	-	-	1	0.4
Total			73	44	26	27	24	23	21	11	7	2	259	
% of Total			28.2	17.0	10.0	10.4	9.3	8.9	8.1	4.2	2.7	0.8		

Figure 9.6: Tonal inflection paradigms in each aspect prefix class

9.2 Verb subject inflection

Once inflected for aspect, a verb stem is a well-formed word which can be pronounced in Tataltepec Chatino, and will be marked for its subject by being followed by a personal pronoun or a noun phrase (or nothing, in which case the verb is interpreted to have a third-

person subject). This aspect-inflected verb form is also the input for tonal and vowel ablaut processes which can be used to mark a first-person or second-person singular subject of the verb (as was demonstrated in Table 9.1 above). This section will describe this non-concatenative subject inflection. After a brief review of other strategies used to express the subject of a verb, the second-person singular subject inflection processes will be discussed (§ 9.2.1) followed by the more complex system used to express first-person singular subjects (§ 9.2.2).

The subject of the verb can be indicated by one of four strategies: with no overt subject leading to an interpretation of the third-person topic as the subject (29), the juxtaposition of a noun phrase following the verb complex (30), the hosting of a clitic pronoun on the verb complex (31), or a tone/nasality mutation of the verb stem (32).

(29) *no kwatzíʔ ^{0}xùʔ naʔnì tyalá l-^{0}aka=wiʔ / k-^{0}ja=na si* ***k-aku***
NOM iguana old animal angry S-be(.3)=AFMN / P-die=1IN if P-eat(.3)
'The beaded lizard$_i$, that's a fierce animal$_{i/*j}$. You die if **it**$_{i/*j}$ **bites**.' (ASFM03)

(30) *nkaʔà k-^{0}jwi tyja* ***k-aku*** ***^{0}nyatèn***
no_more P-be_found(.3) tortilla P-eat(.3) people
'They couldn't find tortillas for the **people to eat** anymore.' (FMC02)

(31) *tyalá tzaă jyoʔó xtyaʔán=naàʔ cháʔ nă* ***k-aku=naàʔ*** *knyá*
angry very deceased mother=1SG because NEG P-eat=1SG chile
'My mother was very angry because **I wouldn't eat** chile.' (ASFM02)

(32) a. ***k-^{0}akòn*** *jakwā ^{0}tyaʔa tyja*
P-eat.1SG four NCL tortilla
'**I will eat** four tortillas' (BGH01)

b. **k-^{0}akòn=naàʔ jakwā ^{0}tyaʔa tyja*
P-eat.1SG=1SG four NCL tortilla
Intended reading: 'I will eat four tortillas'

The tone/nasality mutation cannot co-occur with subject clitics (32-b), though it can occur with a left-dislocated focused subject pronoun, as seen in (33).

(33) *naàʔ naā kwjèn klyuù l-akwen / **naàʔ nt-^{0}akòn** jwaʔăn l-akwen*
1SG be_named bag big.SG C-say(.3) / 1SG H-eat.1SG thus C-say(.3)
'He said, "My name is Big Bag. **Me, I eat** like this"' (ASP05)

The same base form of the verb is used whether the NP or pronominal subject of the verb is singular or plural, unlike in Zacatepec Eastern Chatino where different stems are used for singular and plural subjects (Villard, 2015).

This rest of this section will concern itself only with the inflection of person on verbs through tone and vowel mutations, and a full account of the use of clitic pronouns, noun phrases, and the interpretation of verb phrases without overt subjects will be given in a future description of Tataltepec Chatino syntax.

9.2.1 Second-person singular subject inflection

The tone inflection paradigm for a 2SG subject is quite simple: a second-person verb stem will have one of two tone sequences (/H͡L/ or /0/) which can be almost entirely predicted from the tone of the aspect-inflected stem (T_{ASP}): only five stems do not conform to this generalization.

The tone mutations that are the exponent of second-person subject inflection generally replace the stem tone sequence with one of two tone sequences: either the /H͡L/ for

roughly two-thirds of verbs or /0/ for most of the remaining third of verbs, as can be seen in (34).

(34) Distribution of tone sequences across second-person verb forms by aspect

2SG	COMPL	PROG	HAB+POT
H͡L	68% (143/211)	68% (146/216)	62% (131/211)
0	32% (67/211)	31% (68/216)	37% (78/211)
0L	0% (1/211)	0% (1/216)	-
0-L	-	0% (1/216)	-
0-X	-	-	0% (1/211)
L	-	-	0% (1/211)

(35) lists the T_{2SG} verbs according to the tone sequence of their stem. As seen here, most /H/, /0-L/, /L/, and /0L/-toned stems have /H͡L/ T_{2SG}, and most stems with tone sequences /0-X/, /X/, and /0/ have /0/ as their T_{2SG}. Stems of tone sequence /H͡L/ are equally likely to have either /H͡L/ or /0/ as their T_{2SG}.

(35) Second-person verb tone by stem tone sequence

T_{ASP}	T_{2SG}	$\%T_{ASP}$	T_{ASP}	T_{2SG}	$\%T_{ASP}$
H	H͡L	93.7% (148/158)	0L	H͡L	78.6% (33/42)
H	0	5.7% (9/158)	0L	0	16.7% (7/42)
H	0-X	0.6% (1/158)	0L	0L	4.8% (2/42)
0-L	H͡L	96.3% (105/109)	X	0	66.7% (48/72)
0-L	0	3.7% (4/109)	X	H͡L	31.9% (23/72)
0-X	0	78.2% (79/101)	X	0-L	1.4% (1/72)
0-X	H͡L	21.8% (22/101)	0	0	85.7% (18/21)
L	H͡L	75% (57/76)	0	H͡L	14.3% (3/21)
L	0	25% (19/76)	H͡L	H͡L	50.8% (30/59)
			H͡L	0	49.2% (29/59)
Total	H͡L	421	Total	0L	2
Total	0	213	Total	0-L	1
			Total	0-X	1

Thus, for aspect-inflected verbs of tone sequences /H/, /0-L/, /L/, /0L/, /0-X/, /X/, and /0/, the second-person singular inflected form can be almost entirely predicted, and only aspect-inflected stems with tone sequence /H͡L/ need to be marked for whether the 2SG form will be of tone sequence /0/ or /H͡L/, in which case the stem and the second-person singular forms will be homophonous. Since the H͡L:H͡L stem:2SG pattern was observed in fully half of all H͡L-toned stems in the corpus (30), and another homophonous pattern (0:0) is found in another 18 stems, it seems unlikely that this is an error of the elicitation or analysis of these forms, and likely represents a genuine pattern in the language.

The regular second-person singular inflection paradigm for verb stems in Tataltepec Chatino is summarized in (36).

(36) Second-person singular inflection paradigm for verbs

T_{ASP}	T_{2SG}	T_{ASP}	T_{2SG}
H	H͡L	L	H͡L
0-L	H͡L	0L	H͡L
H͡L	H͡L, 0	0-X	0
X	0	0	0

9.2.2 First-person singular subject inflection

First-person singular subject inflection is more complex than second-person singular subject inflection in two respects. First, many more tone sequences are present among 1SG-inflected verbs, even among those with a single given stem tone sequence. Secondly, the verb will become nasalized if it was not already, and will become non-high, as shown in (37).

(37) Oral vowels become nasal vowels in inflected 1SG forms

i	→	ẽ	ĩ	→	ẽ
e	→	ẽ	ẽ	→	ẽ
a	→	ã	ã	→	ã
o	→	õ	õ	→	õ
u	→	õ			

In stems with underlying nasal vowels, the 1SG differs from the base form only in vowel height in the case of stems with high-front vowels (38), and are identical with bases ending in mid-front vowels (39).

	n-t-akín	C-CAUS-burn(.3)	'burned it'
(38)	*n-t-akīn*	C-CAUS-burn.2SG	'you burned (it)'
	n-t-akén	C-CAUS-burn.1SG	'I burned (it)'

	nkw-seén	C.TR-squeeze(.3)	'squeezed it'
(39)	*nkw-seēn*	C.TR-squeeze.2SG	'you squeezed (it)'
	nkw-seén	C.TR-squeeze.1SG	'I squeezed (it)'

This process is summarized by the rule in (40) in which the vowel in a stressed syllable becomes $\left[\begin{smallmatrix}+\text{nasal}\\-\text{high}\end{smallmatrix}\right]$ when in the presence of an abstract tonal 1SG clitic. Note that this rule is identical to the rule describing the vowel ablaut in nouns inflected for 1SG possessors.

(40) First-person vowel ablaut

$$V_{\sigma_S} \rightarrow \begin{bmatrix}+\text{nasal}\\-\text{high}\end{bmatrix} \quad / \_=T_{1SG}$$

(41) gives the distribution of 1SG tone sequences according to their aspect.

(41) Distribution of tone sequences across first-person verb forms by aspect

1SG	COMPL	PROG	HAB + POT
/0/	0% (1/211)	0% (1/216)	0% (1/211)
/0L/	6% (13/211)	39% (84/216)	4% (8/211)
/0-L/	29% (62/211)	7% (16/216)	77% (163/211)
/0-X/	5% (11/211)	3% (6/216)	0% (1/211)
/H/	44% (92/211)	36% (77/216)	8% (16/211)
/L/	11% (24/211)	8% (18/216)	7% (14/211)
/H͡L/	3% (7/211)	6% (14/216)	4% (8/211)
/X/	0% (1/211)	0% (0/216)	0% (0/211)

The most common T_{1SG} is /0-L/ with 41.1% (238/579) of the corpus having this tone sequence. Next most common is /H/ with 30.1% (174/579), /0L/ with 14.5%, and /L/ representing 8.3% (48/579) of the corpus, as seen in Figure 9.7. Some less common tone sequences for T_{1SG} are /H͡L/ with 3.1% (18/579), /0-X/ with 2.4% (14/579), and /0/ with just 2 and /X/ represented by only one stem in the verb inflection database.

The main paradigms for first-person singular subject inflection for Tataltepec Chatino verbs are summarized in (42). Villard (2015) has found that verb prefix class can be used to predict the particular tone sequence that a 1SG-inflected verb will take in Zacatepec Eastern Chatino. It is unclear at this point if a similar finding correlation can be found in Tataltepec Chatino.

(42) First-person singular inflection paradigm for verbs

T_{ASP}	T_{1SG}	T_{ASP}	T_{1SG}
0-X	0-L	0-L	0-L
X	0-L	L	L, 0-L, 0L, H
H	H	H͡L	0L, H, H͡L, L
0	0L	0L	0L, 0-L, H

T_{STEM}	T_{1SG}	#	$\%T_{STEM}$	T_{STEM}	T_{1SG}	#	$\%T_{STEM}$
H	H	140	88.6%	0-L	0-L	101	92.7%
H	0-L	3	1.9%	0-L	0L	4	3.7%
H	0L	6	3.8%	0-L	L	4	3.7%
H	L	5	3.2%	X	0-L	32	44.4%
H	0-X	2	1.3%	X	L	12	16.7%
H	H͡L	1	0.6%	X	0L	10	13.9%
H	X	1	0.6%	X	H	9	12.5%
0-X	0-L	77	76.2%	X	H͡L	6	8.3%
0-X	0L	9	8.9%	X	0	2	2.8%
0-X	H	7	6.9%	X	0-X	1	1.4%
0-X	H͡L	6	5.9%	0L	0L	24	57.1%
0-X	L	2	2.0%	0L	0-L	7	16.7%
L	L	21	27.6%	0L	H	6	14.3%
L	0-L	18	23.7%	0L	L	4	9.5%
L	0L	14	18.4%	0L	0-X	1	2.4%
L	H	12	15.8%	0	0L	17	81.0%
L	0-X	7	9.2%	0	0-X	3	14.3%
L	H͡L	4	5.3%	0	H͡L	1	4.8%
Total	0-L	238		Total	H͡L	18	
Total	H	174		Total	0-X	14	
Total	0L	84		Total	0	2	
Total	L	48		Total	X	1	

Figure 9.7: First-person verb tone sequence by stem

9.2.3 Subject inflection paradigms

This section will treat the combinations of second- and first-person singular subject inflection paradigms that can be found among the verbs of Tataltepec Chatino. The most common paradigms are first briefly summarized, then individual paradigms will be discussed. Since the subject inflection paradigms are largely predictable based on the tone of the verb's aspect-inflected stem, the remainder of this section will discuss the inflection

paradigms attested for each aspect-inflected stem tone sequence sequence (T_{ASP}).

The major paradigms for verb subject inflection are listed in (43). For some stem tone sequence sequences (T_{ASP}), both the second-person singular form's tone sequence (T_{2SG}) and the first-person singular form's tone sequence (T_{1SG}) can be predicted with a high degree of certainty. This is true where T_{ASP} is /H/, /0-L/, /0-X/, or /0/. For these, the T_{2SG} are /H͡L/, /H͡L/, /0/, and /0/ and their T_{1SG} are /H/, /0-L/, /0-L/, and /0L/, respectively. For two T_{ASP} (/X/ and /H͡L/), the T_{2SG} is less predictable but is one of the two common T_{2SG} tone sequences: /H͡L/ or /0/; for these T_{ASP}, their T_{1SG} are much more predictable, being /0-L/ and /0L/ respectively. The last two T_{ASP} predictably have /H͡L/ as their T_{2SG}, but their T_{1SG} are far less predictable, with three or four tone sequences commonly appearing on their first-person singular forms.

(43) Major subject inflection paradigms for verbs

T_{ASP}	T_{2SG}	T_{1SG}	T_{ASP}	T_{2SG}	T_{1SG}
H	H͡L	H	L	H͡L	L, 0-L, H
0-L	H͡L	0-L	0L	H͡L	0L, 0-L, H
0-X	0	0-L	0	0	0L
X	H͡L, 0	0-L	H͡L	H͡L, 0	0L

In the corpus of verb stems consulted for this study, a large number of stems (27.1% 173/638) do not follow a major pattern, but instead follow one of 52 minor patterns, 19 of which are followed by only one aspect-inflected stem.

The following subsections will fully detail the different subject inflection paradigms observed for each T_{ASP}, beginning with /H/, the most common tone for aspect-inflected verb stems in Tataltepec Chatino.

9.2.3.1 Paradigm H:H͡L:H

Among the person inflection paradigms of /H/-toned stems (laid out in Table (44)), the dominant paradigm used in 84% of /H/-toned stems is H:H͡L:H, as in, for example 'laughed' in (45).

(44) Frequency of verb subject inflection paradigms for /H/-toned stems

T_{ASP}	T_{2SG}	T_{1SG}	$\%T_{ASP}$	% stems
H	H͡L	H	84% (132/158)	21% (132/638)
H	0	H	5% (8/158)	1% (8/638)
H	H͡L	0L	4% (6/158)	1% (6/638)
H	H͡L	L	3% (5/158)	1% (5/638)
H	H͡L	0-L	1% (2/158)	0% (2/638)
H	0	0-L	1% (1/158)	0% (1/638)
H	0-X	0-X	1% (1/158)	0% (1/638)
H	H͡L	0-X	1% (1/158)	0% (1/638)
H	H͡L	H͡L	1% (1/158)	0% (1/638)
H	H͡L	X	1% (1/158)	0% (1/638)

(45)

nkw-stí	C-laugh(.3)	'laughed'
nkw-stī	C-laugh.2SG	'you laughed'
nkw-stén	C-laugh.1SG	'I laughed'

The T_{2SG} of /H/-toned stem is /H͡L/ in 94% (148/158) of stems. The remaining 6% (10/158) have tone sequence /0/. The T_{1SG} is /H/ in 89% (140/158) of stems, with other tone sequences sparingly attested: /0L/ 4% (6 times), /L/ 3% (5 times), /0-L/ 2% (3 times), /0-X/ 1% (twice), /H͡L/ 1% (once), and /X/ 1% (once). Given that T_{ASP}=T_{1SG} for the majority of /H/-toned stems, only vowel nasalization and/or lowering may distinguish the two forms.

9.2.3.2 Paradigm 0-L:H͡L:0-L

Among the /0-L/-tone stems' person inflection paradigms (laid out in (46)), the most frequent is 0-L:H͡L:0-L, as exemplified by 'will crush (it)' (47).

(46) Frequency of verb subject inflection paradigms for /0-L/-toned stems

T_{ASP}	T_{2SG}	T_{1SG}	$\%T_{ASP}$	% stems
0-L	H͡L	0-L	89% (97/109)	15% (97/638)
0-L	H͡L	0L	4% (4/109)	1% (4/638)
0-L	0	0-L	4% (4/109)	1% (4/638)
0-L	H͡L	L	3% (3/109)	0% (3/638)
0-L	H͡L	L	1% (1/109)	0% (1/638)

(47)

∅-s-^{0}atà	P-CAUS-crush(.3)	'will crush (it)'
∅-s-atā	P-CAUS-crush.2SG	'you will crush (it)'
∅-s-^{0}atàn	P-CAUS-crush.1SG	'I will crush (it)'

In stems with underlying nasal vowels, the 1SG differs from the base form only in vowel height in the case of stems with high-front vowels (48), and are identical with bases ending in mid-front vowels (49).

(48)

∅-^{0}takìn	P.CAUS-burn(.3)	'will burn (it)'
∅-takīn	P.CAUS-burn.2SG	'you will burn (it)'
∅-^{0}takèn	P.CAUS-burn.1SG	'I will burn (it)'

(49)

∅-s-^{0}kwèn	P-CAUS-shake(.3)	'will shake (it)'
∅-s-kwēn	P-CAUS-shake.2SG	'you will shake (it)'
∅-s-^{0}kwèn	P-CAUS-shake.1SG	'I will shake (it)'

The majority of T_{2SG} of /0-L/-tone stems are /H͡L/ (96%, 105/109), and the remaining few are /0/ (4% 4/109). The majority of T_{1SG} are /0-L/ (93% 101/109) and the remaining few are /0L/ and /L/, both occurring four times in the dataset.

9.2.3.3 Paradigm 0-X:0:0-L

Among the person inflection paradigms of /0-X/-toned stems (laid out in (50)), the dominant paradigm used in 62% of /0-X/-toned stems is 0-X:0:0-L, as in, for example 'will drink' in (51).

(50) Frequency of verb subject inflection paradigms for /0-X/-toned stems

T_{ASP}	T_{2SG}	T_{1SG}	$\%T_{ASP}$	% stems
0-X	0	0-L	62% (63/101)	10% (63/638)
0-X	H͡L	0-L	14% (14/101)	2% (14/638)
0-X	0	0L	8% (8/101)	1% (8/638)
0-X	H͡L	H	4% (4/101)	1% (4/638)
0-X	0	H͡L	4% (4/101)	1% (4/638)
0-X	0	H	3% (3/101)	0% (3/638)
0-X	H͡L	H͡L	2% (2/101)	0% (2/638)
0-X	H͡L	0L	1% (1/101)	0% (1/638)
0-X	0	L	1% (1/101)	0% (1/638)
0-X	H͡L	L	1% (1/101)	0% (1/638)

(51)

k-^{0}oʔo	P-drink(.3)	'will drink (it)'
k-oʔǒ	P-drink.2SG	'you will drink (it)'
k-^{0}oʔòn	P-drink.1SG	'I will drink (it)'

The majority of T_{2SG} of /0-X/ stems are /0/ (78% 79/101), and the remaining 22% (22/101) are /H͡L/. The T_{1SG} are most commonly /0-L/ (77% 77/101). Other T_{1SG} are /0L/ (9% 9/101), /H/ (7% 7/101), /H͡L/ (6% 6/101), and /L/ (twice).

9.2.3.4 Paradigms L:H͡L:L and L:H͡L:0-L

Unlike the preceding two T_{ASP}, /L/-toned verb stems have a couple distinct paradigms which can be considered to be primary, as can be seen in (52). The two dominant paradigms

are L:H͡L:L (28% 21/76) and L:H͡L:0-L (24% 18/76), as in, 'died' (53) and 'wet it' (54).

(52) Frequency of verb subject inflection paradigms for /L/-toned stems

T_{ASP}	T_{2SG}	T_{1SG}	$\%T_{ASP}$	% stems
L	H͡L	L	28% (21/76)	3% (21/638)
L	H͡L	0-L	24% (18/76)	3% (18/638)
L	H͡L	H	13% (10/76)	2% (10/638)
L	0	0L	11% (8/76)	1% (8/638)
L	0	0-X	9% (7/76)	1% (7/638)
L	H͡L	0L	8% (6/76)	1% (6/638)
L	0	H	3% (2/76)	0% (2/638)
L	0	H͡L	3% (2/76)	0% (2/638)
L	H͡L	H͡L	3% (2/76)	0% (2/638)

(53)

nk-jwì	C-die(.3)	'died'
nk-jwī	C-die.2SG	'you died'
nk-jwèn	C-die.1SG	'I died'

(54)

nkwchàʔ	C.CAUS.wet(.3)	'wet (it)'
nkwchāʔ	C.CAUS.wet.2SG	'you wet (it)'
⁰nkwchànʔ	C.CAUS.wet.1SG	'I wet (it)'

Most of the T_{2SG} forms of /L/-toned stems are /H͡L/ (75% 57/76), and the remainder are /0/ (25% 19/76). There is a good deal of variability in T_{1SG} forms of /L/-tone stems, with /L/ being the most common (28% 21/76), followed by /0-L/ (24% 18/76), /0L/ (18% 14/76), /H/ (16% 12/76), /0-X/ (9% 7/76), and /H͡L/ (5% 4/76).

9.2.3.5 Paradigm 0L:H͡L:0L

Among the person inflection paradigms of /0L/-toned stems (laid out in (55)), the dominant paradigm used in 48% of /0L/-toned stems is 0L:H͡L:0L, as in, for example 'is cooking' in (56).

(55) Frequency of verb subject inflection paradigms for /0L/-toned stems

T_{ASP}	T_{2SG}	T_{1SG}	$\%T_{ASP}$	% stems
0L	H͡L	0L	48% (20/42)	3% (20/638)
0L	H͡L	0-L	17% (7/42)	1% (7/638)
0L	H͡L	H	14% (6/42)	1% (6/638)
0L	0	L	10% (4/42)	1% (4/638)
0L	0	0L	7% (3/42)	0% (3/638)
0L	0L	0L	2% (1/42)	0% (1/638)
0L	0L	0-X	2% (1/42)	0% (1/638)

(56)

n-x-akûʔ	G-CAUS-dress(.3)	'is dressing (it)'
n-x-akūʔ	G-CAUS-dress.2SG	'you are dressing (it)'
n-x-akônʔ	G-CAUS-dress.1SG	'I am dressing (it)'

The most common T_{2SG} of /0L/-toned stems are /H͡L/-toned (79% 33/42), and the remainder are /0/ (17% 7/42) with /0L/ occurring twice. The most common T_{1SG} is /0L/ (57% 24/42), with other tone sequences being attested: /0-L/ (17% 7/42), /H/ (14% 6/42), /L/ (10% 4/42), with /0-X/ occurring once.

9.2.3.6 Paradigms X:0:0-L and X:H͡L:0-L

Among the person inflection paradigms of /X/-toned stems (laid out in (57)), the dominant paradigms are X 0 0-L and X H͡L 0-L, which account for 26% (19/72) and 18% (13/72) of /X/-toned stems.

(57) Frequency of verb subject inflection paradigms for /X/-toned stems

T_{ASP}	T_{2SG}	T_{1SG}	$\%T_{ASP}$	% stems
X	0	0-L	26% (19/72)	3% (19/638)
X	H͡L	0-L	18% (13/72)	2% (13/638)
X	0	L	13% (9/72)	1% (9/638)
X	0	0L	10% (7/72)	1% (7/638)
X	0	H	8% (6/72)	1% (6/638)
X	0	H͡L	7% (5/72)	1% (5/638)
X	H͡L	H	4% (3/72)	0% (3/638)
X	H͡L	L	4% (3/72)	0% (3/638)
X	0	0	3% (2/72)	0% (2/638)
X	H͡L	0L	3% (2/72)	0% (2/638)
X	0-L	0L	1% (1/72)	0% (1/638)
X	H͡L	0-X	1% (1/72)	0% (1/638)
X	H͡L	H͡L	1% (1/72)	0% (1/638)

Examples of verbs with these paradigms include *nkw-taʔan* (C-walk) 'walked' in (58) and *nkw-tuʔu* (C-insert) 'inserted (it)' in (59).

	nkw-taʔan	C-walk(.3)	'walked'
(58)	*nkw-taʔǎn*	C-walk.2SG	'you walked'
	nkw-^{0}taʔàn	C-walk.1SG	'I walked'

	nkw-tuʔu	C.CAUS-insert(.3)	'inserted (it)'
(59)	*nkw-tuʔū*	C.CAUS-insert.2SG	'you inserted (it)'
	nkw-^{0}tuʔù	C.CAUS-insert.1SG	'I inserted (it)'

The most common T_{2SG} is /0/ (67% 48/72), with most of the remainder being /H͡L/ (32% 23/72), with /0-L/ attested once. The most common T_{1SG} is /0-L/ (58% 42/72) with other tone sequences attested: /L/ (17% 12/72), /0L/ (14% 10/72), /H/ (13% 9/72), /H͡L/ (8% 6/72), with /0/ occurring twice and /0-X/ once.

9.2.3.7 Paradigm 0:0:0L

Among the person inflection paradigms of /0/-toned stems (laid out in (60)), the dominant paradigm used in 71% of /0/-toned stems is 0 0 0L, as in, for example 'is removing it' in (61).

(60) Frequency of verb subject inflection paradigms for /0/-toned stems

T_{ASP}	T_{2SG}	T_{1SG}	$\%T_{ASP}$	% stems
0	0	0L	71% (15/21)	2% (15/638)
0	H͡L	0L	10% (2/21)	0% (2/638)
0	0	0-X	10% (2/21)	0% (2/638)
0	H͡L	0-X	5% (1/21)	0% (1/638)
0	0	H͡L	5% (1/21)	0% (1/638)

(61)

nklyoŏ	G.CAUS.remove(.3)	'is removing (it)'
nklyoŏ	G.CAUS.remove.2SG	'you are removing (it)'
nklyoôn	G.CAUS.remove.1SG	'I am removing (it)'

The most common T_{2SG} of /0/-tone stems is /0/, found in 86% (18/21) of such stems, with the remaining three taking /H͡L/. The most common T_{1SG} takes /0L/ (81% 17/21), with /0-X/ occurring three times and /H͡L/ occurring once.

9.2.3.8 Paradigm H͡L:0:0L

Among the person inflection paradigms of /H͡L/-toned stems (laid out in (62)), the dominant paradigm used in 22% of /H͡L/-toned stems is H͡L:0:0L, as in, for example 'is selling it' in (63).

(62) Frequency of verb subject inflection paradigms for /H͡L/-toned stems

T_{ASP}	T_{2SG}	T_{1SG}	$\%T_{ASP}$	% stems
H͡L	0	0L	22% (13/59)	2% (13/638)
H͡L	H͡L	0L	14% (8/59)	1% (8/638)
H͡L	H͡L	L	12% (7/59)	1% (7/638)
H͡L	H͡L	H	10% (6/59)	1% (6/638)
H͡L	0	H͡L	10% (6/59)	1% (6/638)
H͡L	0	H	8% (5/59)	1% (5/638)
H͡L	H͡L	H͡L	8% (5/59)	1% (5/638)
H͡L	H͡L	0-L	5% (3/59)	0% (3/638)
H͡L	0	0-X	5% (3/59)	0% (3/638)
H͡L	0	0	2% (1/59)	0% (1/638)
H͡L	H͡L	0-X	2% (1/59)	0% (1/638)
H͡L	0	L	2% (1/59)	0% (1/638)

(63)

nty-jwīʔ	G-sell(.3)	'is selling (it)'
nty-jwǐʔ	G-sell.2SG	'you are selling (it)'
nty-jwênʔ	G-sell.1SG	'I am selling (it)'

The T_{2SG} of /H͡L/-tone stems are split between /H͡L/ (51% 30/59) and /0/ (49% 29/59). The most common T_{1SG} of /H͡L/-tone stems are /0L/ (36% 21/59), with other tone sequences attested: /H/ (19% 11/59) and /H͡L/ (19% 11/59), /L/ (14% 8/59), /0-X/ (7% 4/59), with /0/ attested once.

9.3 Verb inflectional classes

For some stem tone sequences, a single tonal paradigm can account for a large number of the aspect and person inflection morphology of the verb, meaning that for many verbs in Tataltepec Chatino, all twelve forms in their aspect and subject inflection matrices can be entirely predicted by the tone of the verb root. (64) shows some examples of

this. The particular root tone of a verb, like -^{0}*staà* 'place' with a /0-L/ and -*s*-^{0}*alu* with /0-X/ can predict all the common verb forms. These "regular verbs" can be quite numerous: nearly two-thirds of /H/-toned stems (the most common T_{STEM} in the language) follow one particular tonal pattern, like -*lú* 'dig' in (64).

(64) Three regular verbs

Person	Completive		Progressive		Habitual		Potential	
STEM	/H/	*nkw-lú*	/H/	*nklyú*	/0-L/	*nkw-*^{0}*lù*	/0-L/	*kw-*^{0}*lù*
2SG	/H͡L/	*nkw-lū*	/H͡L/	*nklyū*	/H͡L/	*nkw-lū*	/H͡L/	*kw-lū*
1SG	/H/	*nkw-lón*	/H/	*nklyón*	/0-L/	*nkw-*^{0}*lòn*	/0-L/	*kw-*^{0}*lòn*
STEM	/0-L/	*nkw-*^{0}*staà*	/0L/	*nxtyaâ*	/0-L/	*n-*^{0}*staà*	/0-L/	*∅-*^{0}*staà*
2SG	/H͡L/	*nkw-staā*	/H͡L/	*nxtyaā*	/H͡L/	*n-staā*	/H͡L/	*∅-staā*
1SG	/0-L/	*nkw-*^{0}*staàn*	/0L/	*nxtyaân*	/0-L/	*n-*^{0}*staàn*	/0-L/	*∅-*^{0}*staàn*
STEM	/0-X/	*nkw-s-*^{0}*alu*	/0/	*nx-alŭ*	/0-X/	*n-s-*^{0}*alu*	/0-X/	*∅-s-*^{0}*alu*
2SG	/0/	*nkw-s-alŭ*	/0/	*nx-alŭ*	/0/	*n-s-alŭ*	/0/	*∅-s-alŭ*
1SG	/0-L/	*nkw-s-*^{0}*alòn*	/0-L/	*nx-*^{0}*alòn*	/0-L/	*n-s-*^{0}*alòn*	/0-L/	*∅-s-*^{0}*alòn*

This section discusses some of the patterns which can be considered regular in that both the aspect and the subject inflection paradigm used to inflect a given verb is one of the major paradigms. While some of these are indeed common enough to be considered regular in all senses (especially the H matrix), others are not robustly encountered, though further investigation into the inflection of non-regular verbs may uncover previously-unnoticed regularities or could identify analogical leveling (e.g. replacing the expected T_{H} with T_{G} in light of the segmental congruity of many of these verbs) which has brought about irregularities recently.

The figures in this section are organized as matrices, with the horizontal line indicating the aspect and the vertical line indicating whether a particular verb form would be inflected only for aspect (T_{ASP}) or by a combination of aspect and subject (either first- or

second-person singular. At least two aspect paradigms are presented for each root tone, both an invariant across the board pattern (ATB) and one or more patterns in which at least one aspect is distinct from the others. If there are more than one such major paradigms, these are distinguished by a subscript letter. If there is more than one pattern of subject inflection available to a given tone, then these are reported in additional matrices below, and each such paradigm is distinguished from its pair by a subscript number. To aid quick comparison of these matrices, any combinations which are not invariant across all paradigms for a given root tone (say, if two paradigms differ in their T_{G+1SG}) then the cells reporting the tone sequences of these combinations are shaded gray.

9.3.1 H-stem inflection matrices

Of the 194 verbs in my database which have all twelve aspect-subject tone inflections recorded, the H paradigm in (65) is found on 24% (47/194) of them, and on 64% (47/73) of /H/-toned verbs. In contrast the "regular" H_{ATB} paradigm is attested on only 3 stems (1.5% of stems, 4% of /H/-toned verbs). Note that these two paradigms differ only in their $T_{H/P}$ and $T_{H/P+1SG}$ forms, which are /0-L/ in paradigm H and /H/ in paradigm H_{ATB}.

(65) H-stem inflection matrices

H	T_C	T_G	$T_{H/P}$	H_{ATB}	T_C	T_G	$T_{H/P}$
T_{ASP}	H	H	0-L	T_{ASP}	H	H	H
T_{2SG}	H͡L	H͡L	H͡L	T_{2SG}	H͡L	H͡L	H͡L
T_{1SG}	H	H	0-L	T_{1SG}	H	H	H

9.3.2 0-X-stem inflection matrices

(66) shows the paradigms available to /0-X/-toned verbs. The person inflection scheme of paradigm 0-X is slightly different from the numerically most common pattern (T_{G+1SG} is /0L/ not /0/), as is the case with paradigm 0-L below.

(66) 0-X-stem inflection matrices

0-X	T_C	T_G	$T_{H/P}$	0-X_{ATB}	T_C	T_G	$T_{H/P}$
T_{ASP}	0-X	0	0-X	T_{ASP}	0-X	0-X	0-X
T_{2SG}	0	0	0	T_{2SG}	0	0	0
T_{1SG}	0-L	0L	0-L	T_{1SG}	0-L	0L	0-L

Paradigm 0-X is used to inflect 12 verbs, which accounts for 6% of stems and 44% (12/27) of /0-X/-toned verbs. Paradigm 0-X_{ATB} is used to inflect 4 verbs, which accounts for 2% of stems and 15% of /0-X/-toned verbs.

9.3.3 0-L-stem inflection matrices

(67) shows the paradigms available to /0-L/-toned verbs. The person inflection scheme of paradigm 0-L is slightly different from the numerically most common pattern (T_{G+1SG} is /0L/ not /0/), as was the case with paradigm 0-X above.

(67) 0-L-stem inflection matrices

0-L	T_C	T_G	$T_{H/P}$	0-L_{ATB}	T_C	T_G	$T_{H/P}$
T_{ASP}	0-L	0L	0-L	T_{ASP}	0-L	0-L	0-L
T_{2SG}	H͡L	H͡L	H͡L	T_{2SG}	H͡L	H͡L	H͡L
T_{1SG}	0-L	0L	0-L	T_{1SG}	0-L	0-L	0-L

Paradigm 0-L is used to inflect 11 verbs, which accounts for 6% of stems and 69% (11/16) of /0-L/-toned verbs. Paradigm 0-L_{ATB} is used to inflect 1 verb.

9.3.4 X-stem inflection matrices

(68) shows the paradigms available to /X/-toned verbs.

(68) X-stem inflection matrices

X_1	T_C	T_G	$T_{H/P}$	X_{ATB1}	T_C	T_G	$T_{H/P}$
T_{ASP}	X	H͡L	X	T_{ASP}	X	X	X
T_{2SG}	0	0	0	T_{2SG}	0	0	0
T_{1SG}	0-L	0L	0-L	T_{1SG}	0-L	0-L	0-L
X_2	T_C	T_G	$T_{H/P}$	X_{ATB2}	T_C	T_G	$T_{H/P}$
T_{ASP}	X	H͡L	X	T_{ASP}	X	X	X
T_{2SG}	H͡L	0	H͡L	T_{2SG}	H͡L	H͡L	H͡L
T_{1SG}	0-L	0L	0-L	T_{1SG}	0-L	0-L	0-L

Paradigms X_1, X_2 and X_{ATB2} are used to inflect only 1 verb each. Paradigm X_{ATB1} is used to inflect 4 verbs, which accounts for 2% of stems and 18% (4/22) of /X/-toned verbs.

9.3.5 L-stem inflection matrices

The picture is most complex with the matrices that an /L/-toned verb may use to inflect. These are summarized in (69).

(69) L-stem inflection matrices

L_{a1}	T_C	T_G	$T_{H/P}$	L_{b1}	T_C	T_G	$T_{H/P}$	L_{ATB1}	T_C	T_G	$T_{H/P}$
T_{ASP}	L	$\widehat{HL}$	0-X	T_{ASP}	L	0L	0-X	T_{ASP}	L	L	L
T_{2SG}	$\widehat{HL}$	0	0	T_{2SG}	$\widehat{HL}$	$\widehat{HL}$	0	T_{2SG}	$\widehat{HL}$	$\widehat{HL}$	$\widehat{HL}$
T_{1SG}	L	0L	0-L	T_{1SG}	L	0L	0-L	T_{1SG}	L	L	L
L_{a2}	T_C	T_G	$T_{H/P}$	L_{b2}	T_C	T_G	$T_{H/P}$	L_{ATB2}	T_C	T_G	$T_{H/P}$
T_{ASP}	L	$\widehat{HL}$	0-X	T_{ASP}	L	0L	0-X	T_{ASP}	L	L	L
T_{2SG}	$\widehat{HL}$	0	0	T_{2SG}	$\widehat{HL}$	$\widehat{HL}$	0	T_{2SG}	$\widehat{HL}$	$\widehat{HL}$	$\widehat{HL}$
T_{1SG}	0-L	0L	0-L	T_{1SG}	0-L	0L	0-L	T_{1SG}	0-L	0-L	0-L

Paradigm L_{A1} is used to inflect 1 verb, L_{B2} and L_{ATB1} inflect 2 verbs each, L_{B1} three, and L_{A2} four, meaning that the most common of these paradigms inflects only 2% of stems in the corpus and 7% (4/54) of /L/-toned stems. One of these potential "regular" paradigms, L_{ATB2}, is not used to inflect any of the verbs in the corpus so far.

The verb inflection classes are quite complex, and further research may draw out simplifications of the system to reduce the number of inflectional classes present in the language.

Chapter 10

Conclusion

This work has shown that Tataltepec Chatino has much to offer to Zapotecan and Mesoamerican linguistics, as well as the field of linguistics writ large. The language has a complex system of tone in which tone sequences are the crucial morphological element rather than the constituent tones of the tone sequences. The tone system has a slightly peculiar inventory, with the level tones Low, High, and Superhigh rather than Low, Mid, and High in addition to a High-Low contour tone. The tonal system is also notable given the unlinked tone in two tone sequences which only surfaces in particular phonological contexts, but is never displaced from the word it is associated with, unlike canonical floating tones. The segmental phonology shows a language that permits a large number of often very complex onset clusters many of which violate the Sonority Sequencing Principle, but maintains tight restrictions on codas, allowing only a simple coda which can only be filled by one of two consonants in the language. The greater understanding of Tataltepec Chatino phonology that is present in this work will inform the reconstruction of Proto-Chatino, especially with regard to tone.

Tataltepec Chatino has also been seen to have interesting morphological features in its complex systems of verb aspect and person inflection which are instantiated by a system of prefixes and a system of complex paradigmatic alternations which only partially

intersect. The study of these paradigms will inform reconstructions of the verb inflection of Proto-Coastal Chatino and Proto-Chatino, and will no doubt shed new light on the kinds of morphological change that are possible with multiplanar inflectional system like these.

Tataltepec Chatino also may be able to inform studies of the functions of numeral classifiers given the presence of its unusual pseudoclassifier which appears to serve some pragmatic functions of numeral classifiers while failing to do any lexical classification.

Further research on Tataltepec Chatino will advance our understanding of this language and how it fits into typologies of the world's languages, and will no doubt uncover more interesting facts.

Appendices

Appendix A

Abbreviations

Here is an alphabetically sorted list of the abbreviations used in this dissertation. Not inlcuded in this list are the keys to recordings, which are listed in Appendix B.

3	third-person
1EX	first person plural exclusive
1IN	first-person plural inclusive
1SG	first-person singular
2PL	second-person plural
2SG	second-person singular
3PL	third-person plural
ADD	additive
AFF	affective
AFMN	aforementioned
ANIM	animate
ANIMAL	non-human animal
ART	article
ASP	aspect
ASSOC	associative
ATB	invariant "across the board" Aspect paradigm
AYU	Ayutla de los Libres Mixtec
B	movement towards a deictic base
C	Completive Aspect
CAUS	causative
CHAY	San Agustín Chayuco Coastal Mixtec
CL	class term
COMP	complementizer
COMPL	Completive Aspect
DECEASED	deceased

DEM	demonstrative
DIST	distal
EUPH	euphonic
FAM	familiar
FEM	feminine
G	Progressive Aspect
GEN	genitive
H	Habitual Aspect
HAB	Habitual Aspect
HUM	human
INDEF	indefinite
INF	infinitive
INTR	intransitive
IRR	Irrealis Aspect
JAM	Santiago Jamiltepec Coastal Mixtec
LIM	limiting
LOC	locative
MASC	masculine
MIR	mirative
MOD	modified
NB	movement away from a deictic base
NCL	numeral classifier
NEG	negative
NOM	nominalizer
NSUB	non-subject
P	Potential Aspect
PAN	San Miguel Panixtlahuaca Eastern Chatino
PERF	perfective
PL	plural
POT	Potential Aspect
PROG	Progressive Aspect
PROX	proximate
PSD	possessed
RED	reduplicated
REL	relativizer
REPL	replacive

RESP	respectful
RN	relational noun
S	Stative Aspect
SG	singular
SJQ	San Juan Quiahije Eastern Chatino
STAT	Stative Aspect
SUBJ	subject
TEO	Santa Lucía Teotepec Eastern Chatino
TR	transitive
TUT	San Pedro Tututepec Coastal Mixtec
YAI	Santiago Yaitepec Eastern Chatino
ZAC	San Marcos Zacatepec Eastern Chatino
ZEN	Zenzontepec Chatino

Appendix B

Key to recordings

This is the key to all the texts referenced in this dissertation. A short alphanumeric key after each example references which recorded text the example is taken from. For each key value, the Resource ID for the text on the Archive of the Indigenous Languages of Latin America (AILLA) is given if the text has been archived as of the writing of this dissertation. Next, the names, genders, and birth years of the Tataltepec Chatino speakers are given along with a brief description of the genre or content of the recording.

KEY	AILLA ID	Speakers	Description
1R04	CTA001R004	Rafael Martínez Cortés (♂ b. 1935) & Alicia Martínez Quiroz (♀ b. 1982)	A young woman interviews an elder about the history of the community.
1R05	CTA001R005	Trinidad Santiago Jiménez (♀ b. 1924)	Personal stories.
1R16	CTA001R016	Leonor Mateo (♂ b. 1928) & Flavia Mateo Mejía (♀ b. 1950) & Socorro Mateo Mejía (♀ b. 1972) & Petra Mateo Mejía (♀ b. 1952)	Three daughters talk with their father about local geography, history, and wildlife.
1R17	CTA001R017	Miguel Jiménez Mateo (♂ b. 1931) & Gervacio Jiménez Hernández (♂ b. 1969)	A son interviews his father.
1R18	CTA001R018	Onofre Cortés (♂ b. 1911) & Socorro Mateo Mejía (♀ b. 1972)	A story of a fantastic journey and local history.
ASFM01-03	not archived	Adolfo Santiago Pérez (♂ b. 1958) & Florencia Mejía Cortés (♀ b. ca. 1955)	Dialogues between a married couple.
ASP01-07	not archived	Adolfo Santiago Pérez (♂ b. 1958)	Personal recollections and folk tales.

KEY	AILLA ID	Speakers	Description
BGH01-02	not archived	Benita Gregorio Hernández (♀ b. 1922)	Descriptions of types of work.
EML01	not archived	Eusebio Mateo Ruiz (♂ b. ca. 1930)	Two folk tales: the story of Juan Cenizas and the story of Jesus and the rich man.
EPJ01	not archived	Elpidio Pérez Jiménez (♂ b. 1931)	Recollections on his service to the community.
FMC01-04	not archived	Florencia Mejía Cortés (♀ b. ca. 1955)	Personal recollections.
FMM01	not archived	Flavia Mateo Mejía (♀ b. 1950)	How Tataltepec was founded.
LQA01-04	not archived	Lorenzo Quiroz Arellano (♂ b. ca. 1930)	Descriptions of local culture, geography, and history.
SMJ01-02	not archived	Salomón Mejía Jiménez (♂ b. 1934)	Personal recollections.

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